Air and Space Power Course
Introduction

Welcome to the Air and Space Power Course. This course is designed to prepare you to responsibly articulate and advocate air and space power in the joint warfighting arena. This course provides a basic understanding of how the principles and concepts of airpower doctrine evolved over the years and how this doctrine has remained sound and enduring guidance over many years of political and technological change. It begins by examining the historical foundations of airpower doctrine, as debated and promulgated from the early years of flight up to modern times. Next, the course discusses current doctrine as contained in Air Force and joint doctrine documents. Additionally, the Army, Navy, and Marine Corps views on air and space power are presented. Finally, the course examines the role of air and space power in the joint operational environment, as well as unresolved issues concerning the proper employment of air and space power. Hopefully, you'll find the Air and Space Power Course both interesting and informative, and it will help you to advocate the proper use of air and space power in pursuit of joint and national objectives.

Air Power Theory

Introduction

Although modern airpower is significantly different than it was at the beginning of the last century, it has retained its inherently strategic nature. Early airmen such as Billy Mitchell, Hap Arnold, Ira Eaker, and Curtis LeMay saw the potential of an independent air force and of the strategic effects made possible by airpower. Their recognition of the inherently strategic nature of airpower led to the emergence of strategic bombardment as airpower's premier mission.

Even though our Air Force and no less than 17 other western air forces subscribe to the concept of strategic airpower, the concepts of strategic attack are not well understood. Many view strategic attack as the mission of particular platforms like the bombers of World War II or the ICBMs of the Cold War. Others see strategic attack as simply an extension of surface-based firepower that is able to strike at any range. In reality, strategic attack is the capability to achieve **effects** that directly address campaign objectives at the strategic level of war. Strategic attack is one of airpower's unique capabilities. Rather than pursuing tactical objectives in a sequential manner to enable decisive strategic effects, airpower offers the capability to directly pursue strategic objectives. Understanding this strategic nature of airpower is fundamental to understanding airpower theory.

Lesson Objective

This lesson introduces you to the early airpower theories as expressed by Guilio Douhet, Hugh Trenchard, and Billy Mitchell. The objective of this lesson is for you to comprehend the genesis and importance of strategic bombardment as a central focus in airpower theory. At the end of the lesson, you should be able to explain the influence of early airpower theorists on the development of airpower doctrine. In addition, you should be able to explain why strategic bombardment became central to airpower theory. Furthermore, you should be able to summarize the significant influence of General Billy Mitchell in promoting the theories of airpower within the United States and his role in shaping the airpower doctrine that survives today.

Overview

To support the learning objective, this presentation discusses how the lessons of World War I served as the motivation for developing strategic airpower. The lesson further covers how the introduction of the airplane in World War I offered an alternative to the carnage of static ground warfare. In addition, the lesson discusses how early airpower theorists shaped airpower thinking. The lesson culminates with an overview of how General Billy Mitchell impacted the evolution of U.S. airpower doctrine. To understand the revolutionary importance of airpower, you must first appreciate the horrors of World War I, in which millions died over the course of years of trench warfare.

Early Perspective of war

For centuries, armed men meeting on a field of battle have resolved wars. The history of warfare, involving land and sea combat, is marked by brutal fighting. Early warfare

typically involved massed formations of combatants striving to defeat each other by inflicting more casualties that their opponent. Victory was usually determined by "the last man standing."

Rise of Total War

By the nineteenth century, warfare had evolved into total war, involving resources and populations of entire nations. No longer were wars fought almost exclusively by trained soldiers or hired mercenaries; it came to involve entire populations, including both citizen soldiers and ordinary citizens. World War One gave birth to total war in the industrial age when huge armies of soldiers faced each other across battlefields that had been made horribly lethal by technological advances in weaponry. Shortly after the war began, the belligerents mobilized over 65 million troops. In spite of the huge armies, both sides expected a quick end to the war, and both sides went on the offensive. However, the war quickly settled into one of tactical deadlock in the trenches. Understanding the context and consequences of World War I is critical for airmen and their views on airpower theory.

WWI Perspective

A view into what the "quick" war would become occurred in August 1914, when out of the 1.5 million French troops who went on campaign, nearly one in four were casualties after six weeks of fighting. This bloody toll foreshadowed the carnage that would follow as over 8 million combatants were killed and total casualties numbered over 37 million. Over half of all the forces mobilized were casualties of the fighting. Among the noncombatants approximately 10 million were killed, and again, tens of millions more injured. As the war continued, strategies changed from one of securing ground to one of bloody attrition. The war quickly settled into static trench warfare between armies, which employed poison gas, machine guns, and artillery bombardment to effect wholesale slaughter along battlefields spanning hundreds of miles.

Context for Airpower

It is impossible to understand the early theorists and their views on airpower without putting yourself into the context of their times. The Great War had been one of seemingly endless days of bloodshed and death. World War I was the worst agony in the consciousness of mankind; nothing could be perceived that would be worse than another try at war in the trenches. Practically everyone agreed that the era of total war was here to stay and that on the ground, the defensive form of combat was in great ascendancy. The endless suffering of war on the Western front was the major driving factor behind the strategic air theory and air doctrine of the 1920s and the 1930s.

Aircraft as a Military Tool

The appearance of aircraft in World War I offered an alternative to the static warfare of the trenches. Although aircraft were primarily employed for observation and reconnaissance, the advantages of employing them as offensive weapons soon became apparent. Aircraft provided a means of break-through, and they brought the concept of aerial maneuver into military operations. Aircraft offered the hope of ending static, defensive warfare by carrying the offensive to the enemy homeland. The airplane

could easily cross the fixed lines of trenches and strike the enemy's vital centers, such as their industry, population, and military forces. After years of carnage in the trenches, the ability to move easily to the enemy homeland was truly an exciting prospect. Adding to the appeal of being able to cross the deadly trenches was the concept that aircraft could strike targets that would have a significant effect on the fielded armies: their supplies and armaments. Suddenly, the ability to affect the industrial machine that fed the carnage of battle became a possibility.

Aircraft for Strategic Effects
As aircraft technology improved and airmen became more skilled in airpower employment, the potential for attacking key vital centers became clearer. While using aircraft to attack enemy surface forces seemed logical, many airmen believed that destroying enemy forces was not the decisive element for winning a war. Rather, they saw destroying key vital centers as the critical element. Airmen saw a means of diminishing the industrial engine that had made the Great War possible. By crippling supplies and transportation, airmen saw possibilities of strategic effect that far exceeded the tactical employment of aircraft.

Early Airpower Theorists
To most military officers, the airplane seemed to offer a useful tool to supplement the traditional forms and manner of warfare. Thus, it was employed for observation, reconnaissance, and aiming of artillery. Later, it found value as an attack platform operating close to the troops or a short distance to the enemy rear. In a move toward more strategic targeting, aircraft were used to attack vital centers such as headquarters, supply depots, railheads, troops moving to the front, and similar military targets. A few early aviation theorists, however, had grander visions for airpower. These theorists envisioned aircraft operations that were independent of surface armies or navies. To these few, the aim of war was not the attrition of surface forces, but the destruction of vital elements of the enemy capability to wage war. Airmen realized that by striking the enemy's vital centers, airpower held the key to victory. The question loomed, however, as to what constituted a key vital center. To early airpower theorists, vital centers included factories, transportation hubs, centers of government, and war material production capabilities. Several early theorists saw the potential of airpower, but only a few articulated it well enough to cause change and to affect the manner in which airpower would develop. Among those significant early theorists were Guilio Douhet of Italy, Hugh Trenchard of England, and William "Billy" Mitchell from the United States. Let's review their contributions to airpower theory.

Airpower Theorists Douhet
Guilio Douhet was born in Italy in 1869. He came from a military family, and he served as a professional artillery officer in the Italian Army. Although not a pilot, he was appointed as the commander of Italy's first aviation battalion. During World War One, Douhet was so critical of the leadership of the Italian High Army Command that he was court-martialed and imprisoned for a year. However, his criticisms were validated in 1917 in the disastrous Battle of Caporetto, in which Italians suffered over 300,000 casualties and lost most of their trench artillery. After the war, when Mussolini came to

power, Douhet was restored to a place of honor. He passed his remaining years writing about and speaking out for airpower. Douhet published, "Command of the Air" in 1921. This book quickly became known in America through partial translations and word of mouth; but it didn't appear in a published English version until 1942, twelve years after Douhet died.

Douhet's Theory

Douhet's theories on airpower have had a lasting effect on airpower employment. The major premise of Douhet's theory was his belief that during war, a quick victory could be won by early air attack on the enemy's vital centers, while surface forces worked to contain the enemy on the ground. Douhet differed from other prominent early theorists by proposing that civilian populations be directly targeted as part of the air campaign. Key aspects of Douhet's theories can be viewed by placing your cursor over each of the bullets below.

Implication of Douhet's Theory

Douhet's ideas regarding the role of airpower contained several implications regarding the use of airpower in the conduct of warfare. A summary of his implications can be viewed by passing your cursor over each of the bullets below.

Douhet's Impact

Douhet's theories regarding airpower had a significant impact on many nations during his time. Again, the impact of Douhet's theories can be viewed by rolling your cursor over the bullets.

Airpower Theorists Trenchard

Hugh Trenchard was well along in his military career when he learned to fly at age 40. He fought much of World War One as the head of the Royal Flying Corps in France, and was firm in his vision of aviation as an auxiliary to the army. At first, Trenchard opposed the creation of an independent air force, and he even opposed the idea of strategic bombing. He was, however, a firm believer in offensive operations for air forces. Like ground commanders of the time, he believed in the massed offensive as the key to victory. Only in Trenchard's case, this idea of mass involved aircraft in the air. Unfortunately, the Royal Flying Corps suffered substantial losses as a result of his commitment to the massed offensive. Nonetheless, Trenchard ended up in command of the Independent Air Force in France in 1918, which was created in response to the German bombing of London. A considerable portion of the Independent Air Force's efforts was in support of the Allied armies, and the war ended before the Independent Air Force could conduct much strategic bombing. When he returned to the United Kingdom, Trenchard was appointed as Chief of the Air Staff of the Royal Air Force, or RAF. Soon after, he became an advocate of strategic bombing. He remained in his post for the first decade of the RAF's existence. Trenchard had an influence on the initial founding of many of the RAF's ideas and institutions. Trenchard's ideas were at the center of RAF doctrine manuals and they were embedded in the curriculum at the RAF Staff College.

Trenchard's Theory
Trenchard's theories on airpower have had a lasting effect on airpower employment. The major premise of his theory was his belief that during war, victory could be achieved by bombing enemy vital centers and thus breaking the enemy's will to fight. Pass your mouse cursor over the bullets to view more information about Trenchard's theories.

Implications of Trenchard's Theory
Trenchard's ideas regarding the role of airpower contained several implications regarding the use of airpower in the conduct of warfare. More information on the implications of his theories can be found by passing your cursor over the bullets.

Trenchard's Impact
Trenchard's theories regarding airpower had a significant impact on many nations during his time. Trenchard and Mitchell were contemporaries that shared many similar views. Mitchell often pointed to the Royal Flying Corps as a model for independent airpower. Roll your cursor over the bullets to view more information on the impact of Trenchard's theories.

Airpower Theorists—Mitchell
William "Billy" Mitchell was born in France in 1879 and raised in Wisconsin. He joined the Army Air Force as a Signal Corps Officer, completed   flight training at his own expense, and was appointed to the General Staff all at a young age. Mitchell, who was in Europe when the U.S. entered the war, became the first American aviator to cross enemy lines as a combat pilot and was soon appointed to command of combat aviation at the front. Mitchell led many combat patrols and commanded the nearly 1,500 aircraft of the Saint Mihiel air offensive—the single largest air armada of the time. He was subsequently appointed brigadier general and given command of the Air Service of the Group of Armies. After the war, he headed the Aviation of the Army of Occupation, established in Germany. When he returned from Europe, having led air forces in combat and served as an Allied air commander, he was appointed Assistant Chief of the Air Service. He led an Air Service Provisional Brigade in the bombing tests of various naval vessels and demonstrated the efficacy of airpower by sinking an ex-German battle ship, the "Ostfriesland", with a 2000-pound bomb. Mitchell quickly became the voice of independent airpower. Through numerous speaking engagements and published articles, Mitchell became the leading advocate for a strong, independent air force and a robust national aeronautics capability made up of all types of aviation assets: military, commercial, and general. Because of his zealous campaign for airpower and his open criticism of those charged with airpower's development, he precipitated his own courts martial in 1925. His vocal criticism of the War Department's mismanagement of airpower resulted in his conviction. He left the Army in early 1926 and died in February 1936.

Mitchell's Theory
Mitchell's theories on airpower have had a profound and lasting effect on airpower doctrine and the employment of airpower. He is often referred to as the "father of the

modern Air Force." The major premise of his theories was his belief that an independent and equal air force serving under a unified department of defense was the most efficient means of defending the United States. Other key aspects of Mitchell's theories are presented below and can be viewed by passing your mouse cursor over the bullets.

Implications of Mitchell's Theory
Mitchell's ideas regarding the role of airpower contained several implications regarding the use of airpower in the conduct of warfare. Again, a summary of his implications can be viewed by passing your cursor over the bullets.

Mitchell's Impact
Mitchell's theories on airpower have had a lasting impact on airpower doctrine and the employment of airpower. Some of the significant impacts of Mitchell's theories are presented here and can be viewed by rolling your cursor over the bullets.

Mitchell's Legacy
William "Billy" Mitchell, more than any other individual was responsible for molding the airpower convictions that served as the doctrinal basis of the United States Air Force. As World War I came to a close, Mitchell argued to preserve the aviation expertise gained during the war, both in terms of personnel and equipment. Through prolific writing and speaking, Mitchell carried the airpower case—the case of an independent air force—to the American public. Mitchell's most lasting contribution was moving the idea of air force autonomy to a progressive view, which held that independent air operations could achieve strategic results rather than simply being chained to the support of armies and navies. Mitchell's ideas and goals were adopted and shared by a wide following of early air officers, including "Hap" Arnold and "Tooey" Spaatz. Through Mitchell's advocacy, the concepts of the offensive nature of airpower, the importance of air superiority, the primacy of strategic bombing, and the value of interdiction over close air support became enduring beliefs of modern airpower.

Summary
This lesson discussed how the conduct and carnage of World War I shaped the concepts of early airpower theorists. The most significant concept of early air doctrine was the idea of strategic bombardment. Central to the concept of striking the war-making capabilities of industrialized nations was the realization that massed slaughter on the battlefield did not guarantee victory. Early airmen realized the strategic effects that could produce victory did not depend upon armies achieving tactical success. This lesson has discussed how aircraft offered an alternative to the static nature of trench warfare by attacking the key vital centers of an enemy's war-making ability.
The lesson further illuminated how early airpower theorists, such as Billy Mitchell influenced airpower doctrine. These early airmen expressed many of the fundamental beliefs that have become central to airpower thought. Mitchell's zeal for airpower and his insight into what it offered the nation was instrumental in giving form to the United States Air Force as an independent service. It is only from an understanding of these early events that you can fully gain an appreciation for the evolution of airpower thought

over the decades of powered flight. From these early beginnings were laid the foundations of airpower doctrine.

Foundations of Airpower Doctrine

Introduction

Building and expanding upon the theories of the early air power theorists, this lesson will examine the foundations of air power doctrine as debated and promulgated from the early years of flight through the establishment of the Air Force as a separate service in 1947.

Lesson Objective

 The objective of this lesson is for you to comprehend the impact of early airpower theory on the development of airpower employment concepts and doctrine in the years leading up to the establishment of the Air Force as a separate service in 1947. The lesson will not make you a historian; but, it will provide you with a basic understanding of how the principles and concepts of airpower doctrine evolved, and how this doctrine has remained sound and enduring guidance over many ~~decades~~ years of political and technological change. At the end of the lesson, you will be able to explain the doctrinal underpinnings of the World War Two Strategic Bombing Campaign. You will be able to explain how airpower theory and the lessons learned during World War Two led to the publication of Field Manual one hundred dash twenty, *Command and Employment of Air Power*. You will also be able to summarize the influence of air power theory and wartime experience on the establishment of a separate Air Force in 1947.

Overview

The lesson begins by looking at the Air Corps Tactical School's doctrinal emphasis on strategic bombardment. It examines the General Headquarters Air Force and its emphasis on independent air operations. Then the lesson explores how these thoughts on strategic bombardment and independent air operations led to the development of Air War Plans Division One, the conceptual basis for the World War Two Strategic Bombing Campaign against Germany. Next, the lesson examines the important and enduring nature of the key doctrinal concepts articulated in the 1943 War Department Field Manual one hundred dash twenty. The lesson concludes with a summary of the key events that led to an increase in autonomy for the Army's air arm, culminating with the establishment of the United States Air Force in 1947.

Strategic Bombardment

Many early airpower theorists, including Douhet, Trenchard, and Mitchell, began to realize that airpower was more than merely an extension of surface forces and a provider of services for them. Airpower's ability to bypass surface forces and strike directly at the heart of enemy power offered new ways to approach warfare and offered an alternative to the mass carnage experienced during World War One. The concept of strategic bombardment embodied the ideas of air operations independent of surface warfare and provided the focus for much of the doctrinal thought in the years between World War One and World War Two.

Pursuit Aviation
In the years immediately following World War One, pursuit aviation, a function we now call counter air operations, was generally considered to be the primary mission of the air service. Believing that control of the air was vital to military operations, Brigadier General Billy Mitchell viewed pursuit aviation as the basis of an air force. Within the War Department, pursuit aviation and missions that supported ground forces dominated. Even bombardment aviation was viewed within the context of large-scale surface operations and seen largely as a supporting operation. But soon, this thinking began to change.

Air Corps Tactical School
In 1920, the Army established a **professional** school for the **Air Service** much like the traditional schools for artillery, signal, and other **branches**. This air service school was significant in that it recognized aviation as a distinct specialty within the Army. As the school for the professional development of air officers, it served as the center for doctrinal thinking on airpower. The school started out at Langley Field, Virginia, as the "Air Service Field Officers' School." Its name was changed to the "Air Service Tactical School" in 1922. In 1926, **the Air Corps became the branch for Army aviation and** the school's name was changed to the "Air Corps Tactical School" **In 1931 the school** was permanently moved to Maxwell Field, Alabama. It was at the Air Corps Tactical School that the ideas of the early airpower theorists were scrutinized and formalized to form an integrated body of concepts for the future employment of airpower.

Airpower Debates
Students and faculty at the Air Corps Tactical School discussed and debated the very nature of war itself. "Was defeat of the enemy's fielded forces the object in war, or was defeating the enemy's will to resist the real object?" This question remained central to the direction that airpower was to take. Even within the Air Corps Tactical School there were two competing schools of thought. Those believing in Mitchell's theories contended that airpower should pursue strategic objectives, while others believed that airpower must continue to support surface forces. This debate gained prominence in 1928 when the Air Corps Tactical School commandant forwarded a paper to Washington, DC titled, "The Doctrine of Air Force," which he proposed as the basis for all school texts. It asserted that air forces are always in support of surface forces. The response, by Maj Gen James Fechet, Chief of the Air Corps, contended that the true object in war is to overcome the enemy's will. These differing opinions fueled the debates over the proper use of airpower that occurred not only within the War Department, but within the Air Corps itself during the interwar years.

Ascension of Bombardment
Although pursuit aviation held airmen's attention throughout the 1920s, the strategic nature of airpower had great appeal for fighting wars independent of fielded armies. Thinking within the Air Corps quickly turned to bombardment aviation and the independent role of airpower. By the time the Air Corps Tactical School moved to Maxwell Field in 1931, the primacy of bombardment aviation was firmly established. Significantly, the view that airpower was more than merely a provider of services to

surface forces began to dominate thinking within the Air Corps, especially at the Air Corps Tactical School. In fact, the 1930 revised Air Corps Tactical School text, called *The Air Force,* suggested that bombardment aircraft would always accomplish their mission, even without escort. Unfortunately, a lack of national interest in military forces, internal debates on airpower, and the novelty of aircraft were among many factors that limited doctrinal thought and development. The relatively few airmen of the era focused on strategic bombardment as a means of warfare while doctrinal thinking on pursuit and attack aviation lagged behind.

GHQ Air Force
The increasing prominence of bombardment aviation and the ideas of using air forces as independent striking forces naturally led to thoughts of independence from, or at least autonomy within, the Army. In the years following the establishment of the Army Air Corps in 1926, there were two general schools of thought; one favoring independence from the Army, and the other favoring a compromise solution that would allow the creation of an independent striking force within the Army. The compromise view dominated and resulted in the establishment of General Headquarters Air Force, or GHQ Air Force, in 1935. GHQ Air Force **provided a single headquarters for all operational aviation units in** the Army. While independence-minded airmen still argued for a separate air force, the establishment of GHQ Air Force as a unified and powerful offensive striking force represented a clear move toward a centrally controlled air arm.

GHQ Air Force organization
GHQ Air Force consolidated units in several corps areas into a single organization, which reported to the Chief of Staff in time of peace, and the theater commander in time of war. The commanding general of GHQ Air Force was coequal to the Chief of the Air Corps who retained responsibility for supply and individual training. This organizational chart depicts the command setup for the Army air arm by late 1935. At least in theory, this organization allowed the theater commander to focus a centrally controlled air force on his most important objectives, taking advantage of the inherent capability of airpower to influence the entire theater. Under the guidance of the first commander of the new organization, Maj Gen Frank Andrews, the GHQ Air Force, as a unified striking force, became a reality.

Roles of GHQ Air Force
After GHQ Air Force was created, it ~~still~~ remained to be seen exactly what its role would be. The Army General Staff circulated a paper that divided air operations into four categories: beyond the sphere of ground forces, immediate support of ground forces, defense of seacoasts, and defense of rear areas. Of the objectives included in the "beyond the sphere of ground forces" category, the enemy air force ranked first. Other objectives within this category included hostile communications, munitions storage and factories, power plants and other utilities, and troop concentrations. Operations within the "immediate support of ground forces" category were divided into two phases the "approach to battle" which included operations that we now call interdiction, and the

"battle itself" which included operations which we today call close air support . Not surprisingly, support for the concepts outlined in the General Staff paper were mixed.

Response to roles Proposal
Although the General Staff paper subordinated the idea of strategic aviation, the Office of the Chief of the Air Corps accepted the general thrust of the proposals. **Despite the protests of airmen**, the bulk of the proposals in the General Staff paper were retained and incorporated into Training Regulation 440-15, *Fundamental Principles Of Employment Of The Air Service*. On the other hand, the more hard line officers at the Air Corps Tactical School decried the limited role of strategic aviation and the overall dominance of surface support in the proposals. While many within the War Department considered the GHQ Air Force an excellent compromise to the problem of air organization and employment, some air leaders, such as Billy Mitchell, attacked the plan as "subterfuge," which only "divided aviation into more parts."

GHQ Air Force Pros and Cons
Although a compromise short of independence, most airmen accepted the concept of a GHQ Air Force as a step in the right direction. However, there were obvious shortcomings. Military aviation was split between the GHQ Air Force and the Air Corps and there was still no provision for a separate air budget. Corps area commanders continued to exercise administrative jurisdiction over air personnel, and the General Staff retained the ultimate authority over air matters. In spite of the shortcomings, the GHQ Air Force was an advance that recognized, in concept at least, the air force idea of unified air striking power.

GHQ Air Force Stimulates Doctrine
It's important to note that the creation of the GHQ Air Force stimulated the development of specific doctrine for the use of this force. The creation also strengthened the interest in bombers and bombardment aviation. Maj Gen Frank Andrews, GHQ commander, speaking at the Army War College in 1938, said that the U.S. could best defend its frontiers by attacking the enemy "as far from our shores as we can reach him." Further comments show that he considered bombardment aviation to be the principal strategic force and the true measure of airpower. It seems obvious that General Andrews felt that bombardment aviation was the dominant element of airpower. Although the Air Force Combat Command replaced the GHQ Air Force in 1941, and it, in turn, was **terminated** in the Army Air Forces' reorganization of 1942, the idea of unified, independent air operations was firmly established.

Planning for War
In August of 1941, a group of airmen were given the opportunity to apply the airpower theory and doctrine developed at the Air Corps Tactical School and in the GHQ Air Force. President Roosevelt asked the armed services to write a war plan that provided the number of men and equipment needed to fight a future war against the axis powers. The head of General Hap Arnold's newly created Air War Plans Division, Lt Col Hal George, saw this as an opportunity to incorporate Air Corps Tactical School doctrine into a major war department planning document. Because he needed a working group

to start immediately, George recruited several former colleagues from the tactical school – bomber advocates Lt Col Ken Walker, Maj Haywood Hansell, and Maj Laurence Kuter. What they developed was known as Air War Plans Division 1, or AWPD 1 for short.

AWPD-1
AWPD-1 was the air annex to the overall war plan requested by President Roosevelt in 1941. However, Hal George and his planners went beyond the original request for a list of air resources needed for a war against the axis powers. Instead, the group turned AWPD-1 into a blueprint for strategic air warfare in Europe. The plan grudgingly provided for hemispheric defense, if necessary, and support for a cross-channel invasion of Europe, again, if necessary. The true aim of the plan was to conduct a strategic air campaign against Germany that was based on the concepts of employment first developed at the Air Corps Tactical School in the 1930s. Central to the plan was the concept of high altitude, daylight, precision bombardment against the enemy's will and ability to wage war. With necessary equipment and support, the plan's authors felt that Germany would collapse in six months.

AWPD-1 Objectives
The primary objectives of AWPD-1 were disruption of Germany's electric power and transportation systems, destruction of Germany's oil and petroleum resources, and undermining of enemy morale by air attack against enemy civilian concentrations. Intermediate objectives considered essential to the principal effort required neutralization of German Air Forces through attacks against bases, aircraft factories, and aluminum and magnesium factories. Finally, third-level air action focused on safeguarding friendly air bases in England through attacks against submarine bases, surface ships, and invasion ports. Clearly, the plan incorporated force protection and defeat of the enemy air force (or air superiority) as necessary actions to ensure success of the primary mission. As we know, these fundamental doctrinal principles are still contained in our current doctrine.

Response to AWPD-1
In response to AWPD-1, the War Department's joint Army-Navy board stated that "only land armies can finally win wars". However, the board still felt that prior to undertaking any land campaign against Germany, air forces should have accomplished overwhelming air superiority, rendered enemy economic and industrial life ineffective, weakened the combat effectiveness of enemy fielded forces, and undermined the civilian morale. In other words, while not endorsing the idea of victory through airpower, the board seemed to support the overall concepts in the plan as a means of achieving victory through ground forces. While subsequent plans changed targeting priorities and made other adjustments, the basic doctrinal and conceptual foundations outlined in AWPD-1 remained in place **for the duration of the war in Europe**. AWPD-1 unquestionably represented a major conceptual milestone in the pursuit of the air force idea—that is, an independent service with an independent mission.

Field Manual 100-20
In spite of the doctrinal thinking on independent air operations and unified air striking power that occurred prior to World War Two, the U.S. entered the war with procedures that called for placing air units under the command of land commanders. This arrangement offered air commanders little flexibility in focusing airpower on theater objectives or implementing the major principles of air doctrine. However, in July of 1943, a watershed event occurred when War Department Field Manual 100-20, or FM 100-20, *Command And Employment Of Air Power*, was published. This manual laid out a series of doctrinal principles for the employment of air forces, most of which remain valid today. So powerful was this document that many within the Army ground forces referred to it as the Army Air Forces' "Declaration of Independence."

FM 100-20 Concepts
FM 100-20 captured many of the ideas that early air power enthusiasts, including those at the Air Corps Tactical School, had so diligently fought for. First and foremost, the manual declared that "land power and air power are co-equal and interdependent forces; neither is an auxiliary of the other…." It went on to say that, "… the gaining of air superiority is the first requirement for the success of any major land operation…." In other words, air forces should be used primarily against the enemy's air forces until air superiority is gained. The manual further established the strategic, tactical, and air defense roles as the primary functional missions of air forces.

FM 100-20 Centralized Control
Significantly, FM 100-20 declared that to maximize its inherent flexibility, an air commander must centrally control air power in a theater. Clearly, the discussion of air power as a "battle winning factor of the first importance" and the idea that air power had the "ability to deliver a decisive blow" pleased most airmen who had long sought acknowledgement that air power was far more than merely a supporter of surface forces. Additionally, the manual stated that the theater commander will not normally attach air units to ground force units, a practice that prior to the publication of FM 100-20, was quite commonplace.

Impact of 100-20
FM 100-20 succinctly summarized combat-proven principles for the organization and employment of air forces and set the stage for the independent Air Force of today. While it emphasized that the goal of so-called strategic aviation was defeat of the enemy nation, the manual provided for diversion of strategic aviation to tactical missions when those missions were vital and decisive. In other words, FM 100-20 made it clear that air power had the ability to shift the priority from one mission or objective to another as the situation dictated. This inherent flexibility and versatility of air power was termed its greatest asset. The modern Air Force has come a long way since 1943. Much of our organizational structure has changed, but most of the doctrinal concepts presented so powerfully over half century ago are as valid now as they were then.

Airpower Evolution
Early airpower enthusiasts believed air power was more than merely a provider of services for surface forces. Instead, they believed that airpower, if applied in the right way, could add a completely new dimension to warfare and offer the theater commander an option other than the mass carnage of the trenches. Key to the proper application of air power was the unified control of military aviation by the air leaders themselves. The concept of unified control, or centralized control and decentralized execution as we call it today, did not occur overnight. Instead, it was an evolutionary process that occurred over several decades and ultimately led to the creation of an independent air force in 1947.

Increasing Autonomy
Each step in this evolutionary process resulted in increased autonomy for military aviation. From its inclusion as part of the Army Signal Corps in 1907 to the establishment of the Army Air Service in 1920 and the Army Air Corps in 1926, the importance of army aviation grew along with its influence within the War Department. The establishment of GHQ Air Force in 1935 solidified the idea of a unified air striking force and led to the creation of the Army Air Forces as one of three major army commands. In 1942, army aviation was established as an equal partner within the army command structure. This command arrangement took us through World War Two and set the stage for the establishment of the United States Air Force.

Doctrine Evolves
By the time World War Two ended, a number of key doctrinal concepts concerning airpower were firmly in place. First, the importance of strategic bombardment was clearly established and the development of nuclear weapons gave it a new and unquestioned level of importance. Second, the necessities of defeating enemy air forces throughout the theater and the establishment of air superiority to allow freedom of action for friendly forces while denying the same to the enemy were firmly entrenched. Third, the need for centralized control of theater air forces in order to increase flexibility, establish priorities, and maximize impact throughout the theater was an accepted principle. Finally, the key notion that air power should be applied in an integrated whole rather than as individual parts was established.

US Air Force as a Separate service
By the end of World War Two, the Army Air Forces enjoyed a considerable degree of autonomy within the War Department. In fact, the Chief of The Army Air Forces was a full member of the Joint And Combined Chiefs of Staff, having served in that position since 1942. Coupled with the accepted doctrinal principles for command and employment of air power, the need for the establishment of a separate air force became compelling. The National Security Act of 1947 completely restructured the military departments and created an overall Department of Defense. Most significant was the creation of an independent United States Air Force. As Mitchell had envisioned decades earlier, the United States now had a new defense department and an independent air force – a dream became reality!

Summary

Much has happened since early air power theorists first articulated their ideas on how the airplane changed warfare. Today, we continue to refine and expand upon our doctrinal base. Nevertheless, the ideas and concepts that were so diligently pursued in the years after World War One and the lessons learned during World War Two laid a firm foundation for today's air and space doctrine. Though perhaps changed within the context of new technologies, most of today's fundamental doctrinal principles were in place by the time the U.S. Air Force was created in 1947. Those principles had their genesis in the early theorists, matured through the war years, and guide our air and space forces today.

Excursions

Introduction

The conduct of military operations must be guided by a set of established guidelines or principles. These guidelines or principles are generally referred to as doctrine. Often, doctrine is shaped significantly by factors other than military operations. The truth is that, at times, doctrine has been more a reflection of national policies and the influence of individuals, budgets, and emerging technology, than critical analysis, study, exercises, and experience in the application of airpower. Unfortunately, for numerous reasons, the Air Force drifted away from its doctrinal heritage for a period of time after 1947. This lesson provides insight into some of the areas where the Air Force strayed from established principles and examines the impact of those excursions on the development of Air Force doctrine. It is important to learn from these historical lessons in order to provide an air and space perspective for the joint force operations of the future.

Lesson Objective

The objective of this lesson is for you to gain an understanding of how and why the Air Force diverged from the guiding principles that helped establish it as a separate service. Specifically, the lesson cites historical examples that represent excursions from the airpower doctrine developed from the experiences of the two world wars. At the end of this lesson, you should be able to describe how certain technological advances negatively impacted the adherence to air and space power doctrinal principles. The lesson material will enable you to discuss how political factors caused deviations from established air and space power principles. And finally, you will be able to summarize how internal and external organizational factors swayed the Air Force from its doctrinal foundation.

Overview

 The lesson will begin with a brief review of the historical development of air and space power doctrine. It will then focus on the period immediately following World War Two, when the Air Force became a separate service and began to develop its own airpower doctrine in response to the Cold War. Next, the lesson will examine how the limited war fought in Korea caused the Air Force to deviate from the airpower doctrine established during World War Two. The factors, ~~which~~ that lead to excursions from doctrine during the Vietnam War, will be examined. Finally, the lesson will analyze the aftermath of the Vietnam War and how this war affected later development of Air Force doctrine.

Foundations of Doctrine

The foundations of air and space power doctrine were initially established during the period from 1903 through the Second World War. The guiding principles first codified in Field Manual 31-35, and then Field Manual 100-20, published in 1943, exist in today's present manual, Air Force Doctrine Document One or AFDD One. In the years from 1947 onward, the doctrine proven during World War Two was often forgotten. After

World War Two, the Air Force was driven by a myriad of influences that caused its leaders to deviate from the "basic truths" established in early doctrine.

Air Corps Tactical School
An exploration of the development of Air Force doctrine must begin at the Air Corps Tactical School at Maxwell Field, Alabama. It was here in the air corps' "think tank," that Billy Mitchell's vision of airpower formed the foundation for airpower doctrine. Leaders at the school first argued for the independence of air forces from other branches of the service. They further articulated that centralized command and control was the most efficient method of employing airpower. And finally, early airpower advocates stressed the efficacy of strategic bombing.

WWII Europe
The Second World War was the proving ground for airpower.   The doctrine developed at the Air Corps Tactical School received its baptism by fire in the skies over Germany. The combined bomber offensive by the U.S. and British against Germany was an essential part of winning the war. The success of the bombing solidified the strategic bombing concept in the minds of airpower proponents as being the decisive factor in warfare. Other airpower missions, such as close air support and interdiction, remained tied to supporting surface forces.

WWII Japan
The strategic bombing campaign in the Pacific Theater had a devastating effect on the Japanese homeland. Under the direction of General Curtis E. LeMay, American bombers conducted nighttime, low-level incendiary attacks against vulnerable Japanese cities. By early June 1945, strategic air attacks had completely destroyed five of Japan's principal urban areas.

WWII Nuclear Weapons
The U.S. took unprecedented action to end the Second World War. The dropping of atomic bombs on Hiroshima and Nagasaki concluded the war against Japan. The air war over Japan was so devastating that the U.S. Strategic Bombing Survey came to the following conclusion: "Based upon a thorough investigation, it is believed that Japan would have surrendered prior to 31 December 1945. In all probability it would have surrendered prior to 1 November 1945, even if the atomic bomb had not been dropped." Thus, strategic airpower's ascension to prominence was enhanced in the closing months of World War Two. With the advent of nuclear warfare, strategic air proponents firmly believed that airpower was now decisive in its own right. To many military strategists, nuclear warfare became an "alternative warfighting method." Overall, Air Force leaders believed, "If you have the power to stop the big wars, that same power should stop the little wars as well." This overarching "nuclear war mentality" permeated military thinking for the next four decades. The technological breakthrough that enabled the delivery of nuclear weapons indelibly shaped the force structure and the nature of Air Force doctrine for the ensuing Cold War.

Cold War Doctrine

Following World War Two, the United States became involved in the Cold War. The Soviet Union, and eventually the Warsaw Pact nations of Eastern Europe, were viewed as the potential enemy. In response, the U.S. employed a strategy of "containment" that sought to limit communist expansion. This new deterrent posture focused primarily on the ability to employ strategic and tactical nuclear weapons worldwide. Six years after the start of the Cold War, the Air Force produced its first manual on basic doctrine. Air Force Manual 1-2, published in 1953, reflected the experiences of World War Two and upheld the strategic bombing principle of attacking the enemy's heartland. The manual also indicated that future warfare would involve the use of nuclear weapons. The publication of this manual marked the beginning of the Air Force's excursion away from the doctrinal principles set forth by the Air Corps Tactical School. Air Force doctrine was on a path toward a doctrine based on a strategy of nuclear deterrence.

Massive Retailiation

In 1954, shortly after the publication of AFM 1-2, President Eisenhower adopted a foreign policy of "massive retaliation." This policy sought to counter the growing Soviet threat. It viewed nuclear weapons as a means of deterring war and as a first recourse should deterrence fail. The premise of the policy was that if the Soviet Union attacked Europe, the United States would use tactical nuclear weapons to blunt the assault. In addition, Strategic Air Command would be used to destroy the Soviet heartland with strategic nuclear weapons. Because of its nuclear offensive capability, Strategic Air Command was seen as the prime force for fulfilling the mission of nuclear deterrence. The policy of massive retaliation completed the transition to a military strategy based on nuclear deterrence. Although political policy changed in the years after Eisenhower, strategic nuclear bombing continued to dominate airpower thinking at the expense of doctrine for the conventional employment of airpower as an integrated whole.

Cold War Technology

An additional impediment to the reemergence of sound airpower doctrine during the Cold War was the powerful influence of technology. Funding for new weapons was concentrated in the nuclear realm in support of the national strategy of massive retaliation. The development of the ICBM gave the fledgling Air Force a new mission and role within the defense department. Technology increased the accuracy of nuclear delivery vehicles and allowed the Air Force to use smaller warheads. With smaller warheads, the Air Force could equip a variety of different types of aircraft as nuclear capable bombers. The Air Force's technical superiority in nuclear weapons compensated for the Soviet superiority in conventional weapons and led to further neglect of conventional airpower doctrine.

Flexible Response

 When President Kennedy took office in 1961, he modified Eisenhower's policy of Massive Retaliation and adopted a stance of Flexible Response. This policy included the use of conventional forces in war and offered alternatives to total nuclear war. The alternatives consisted of an increase in conventional weapons systems and introduced

the concept of limited nuclear war. Both President Kennedy and his successor, Lyndon Johnson, determined that effective military power meant stronger conventional military forces and nuclear options short of global nuclear war. Flexible Response marked a shift away from the previous policy of Massive Retaliation. While Kennedy believed nuclear deterrence remained paramount, he also understood that limited wars and low intensity conflicts should be fought with conventional weapons.

The SIOP
Although the policy of Flexible Response sought to increase conventional capability, the Air Force continued to focus on providing a nuclear retaliatory capability. General Curtis E. LeMay's Single Integrated Operations Plan, or SIOP, became the Air Force's highest priority mission. In accommodation of Kennedy's Flexible Response policy, the SIOP employed a counterforce strategy of targeting Soviet military systems and installations as opposed to urban areas. Unfortunately, the SIOP did not represent a strategic air campaign. Quite simply, the SIOP was a targeting plan for nuclear war that provided for a timed release of nuclear weapons over enemy territory. A true air campaign would have employed operational art and integrated the application of all forms of airpower against the enemy. Air Force doctrine's emphasis on the upper end of the spectrum of conflict left a significant doctrinal void on the other end of the spectrum ranging from unconventional warfare to conventional war. This doctrinal shortfall would have a marked impact on how the Air Force would respond to crises in the coming years.

Korea
 Shortly after entering the Cold War, the U.S. found itself involved in the Korean conflict. Since Korea was viewed only as a small part of a larger Soviet plot to dominate the entire world, U.S. leadership decided that the resources diverted to this war would be limited. This meant that nuclear weapons would not be employed. Thus, the use of strategic airpower did not offer the solution that many thought it would. For one thing, the World War Two style strategic bombing proved ineffective in a limited offensive against a non-industrialized country. As a result, strategic bombing in Korea did not produce the effects achieved during World War Two. In addition, the command structure implemented by the Commander in Chief of Far East Command, General Douglas MacArthur, caused numerous airpower coordination problems.

Korean Command Structure
Although the U.S. Joint Chiefs of Staff directed the Far East Command to provide itself with a Joint Command Staff, the command operated for the first two and one-half years without a joint headquarters. An examination of the Far East command structure shows that airpower was parceled out and controlled by separate entities. The Navy controlled Navy airpower, the Marines controlled Marine airpower, and several commands controlled Air Force airpower. Lessons learned during World War Two indicated that airpower is best utilized through a centralized command structure. The failure to develop a true joint theater command structure in the Korean conflict caused numerous airpower employment problems and violated the basic doctrine of centralized control of airpower. The convoluted command structure in Korea reconfirmed many of the hard-learned lessons of World War Two.

Korean War Aftermath
In summary, the U.S. attempted to fight the Korean War the way it fought World War Two. However, circumstances surrounding this particular conflict were different. The nature of limited war precluded airpower from being used in a manner that would have led to a decisive military engagement. Furthermore, a true joint command was not empowered to provide guidance in the employment of airpower. In the end, no coherent air campaign was implemented against North Korea. In the aftermath of Korea, many leaders believed the limited war was an aberration that would not be repeated. The popular position was that the United States would never fight, nor prepare to fight, another war like Korea. Air Force leaders were only too willing to put Korea to rest and get on with the Cold War. Once again, deterrence became the watchword for the politicians and military strategists for the coming decades. The Air Force retained its stance on strategic nuclear bombing of the homeland and virtually disregarded the lessons from the limited war in Korea. When the United States entered the conventional war with Vietnam, the nuclear posture of the defense department, once again, left the Air Force ill-prepared to wage a conventional air war.

Prelude to Vietnam
When the Vietnam conflict began, the Air Force was operating under the 1964 version of Air Force Manual one dash one. The manual bore the signature of nuclear protagonist, General Curtis LeMay. Air Force doctrine incorrectly stated, "the best preparation for limited war is proper preparation for general war." Doctrine of the time stressed planning for general war and it advocated the use of atomic weapons. Airpower doctrine, having been replaced by nuclear doctrine, left the Air Force completely unprepared for the conflict that erupted in Vietnam. The Air Force went to war without a viable doctrine for theater air operations in a conventional conflict.

Objectives in Vietnam
In 1965, President Johnson stated the fundamental premise for U.S. involvement in Vietnam: "Our objective is the independence of South Vietnam and its freedom from attack. We will do everything necessary to reach that objective, and we will do only what is absolutely necessary." The broad political objective was simple and clear-cut. However, the military's role, particularly the Air Force's, in achieving that objective was much more obscure. As it turned out, the American military objective was not to defeat or destroy the enemy. Rather, the military objective was to persuade the enemy that he could not win. By any measure, this policy was a far cry from early Air Force doctrine that saw air power as a decisive factor of war.

Vietnam War 1965-1973
Now you will see how politics, technology, and organizational factors led the Air Force on excursions from its established doctrine. These factors contributed to an overall dismal performance for airpower in Vietnam. Yet, despite these hindrances, there were several shining examples of airpower employment in the midst of the gloom. Look now at Vietnam and see the failures, so you may better understand the successes.

Rolling Thunder Objectives
At the start of the Vietnam conflict, the Joint Chiefs of Staff recommended a hard-hitting, 16-day strategic bombing and interdiction campaign against 94 strategic targets considered critical to North Vietnam's ability to wage war. This program was rejected by President Johnson and Defense Secretary McNamara in favor of ROLLING THUNDER— a graduated bombing campaign of North Vietnam that embodied both political and military objectives. The objectives of the ROLLING THUNDER campaign are shown here.

Rolling Thunder Restrictions
Fearing escalation to a nuclear confrontation with China, President Johnson took personal control of the ROLLING THUNDER bombing campaign from 1965 to 1968. He not only selected targets for bombing, he also dictated timing, ordnance loads, sorties, and alternate targets. In addition, most of the strategic targets inside of North Vietnam were off limits to bombing. The result of ROLLING THUNDER was a bombing campaign that was not only unresponsive to local conditions but also lacking in both operational and tactical flexibility. This lack of flexibility precluded airpower from attaining decisive results. ROLLING THUNDER amounted to a tactical, rather than a strategic, action aimed at sending signals of political will, rather than achieving decisive military objectives.

Rolling Thunder Outcome
ROLLING THUNDER was the longest aerial-bombardment campaign in the history of American airpower. After this campaign failed, it revealed a great deal about the development and application of airpower in a limited war. Foremost among the reasons for ROLLING THUNDER's failure was the disconnect between the political strategy of graduated response and the military objectives. Because of this dichotomy, the campaign failed to achieve the objectives established at the beginning of the war. Contributing to the outcome was the failure of the Air Force to use lessons from the Korean War to prepare its forces to fight in a limited conventional war. Civilian political policy, faulty assumptions on the part of Air Force leaders, and technology aimed at improving the Air Force's capability in a nuclear war, presented the Air Force with a situation in Vietnam for which it was neither doctrinally nor operationally prepared.

Command Arrangements
This quote of General Kenney's initial assessment of command arrangements during World War Two could also be applied to the command arrangements in Vietnam. In World War Two, the command structure neglected to establish centralized command and control of airpower, until General Kenney took steps to rectify the situation. During the Vietnam War, command of U.S. airpower was fragmented and controlled by multiple commanders, a partial list of which appears here. During this conflict, at one time or another, there were at least seven different air wars in progress. This division of airpower contradicted the early foundational principle of centralized command and control that was stressed by the Air Corps Tactical School and other airpower theorists. Airpower was not employed in an integrated fashion. The diffusion of airpower resources made it nearly impossible to obtain a concentrated airpower effort.

Route Package System

The Route Package System is an example of this diffused responsibility. This system was a control arrangement devised by Air Force and Navy commanders because they could not reach a satisfactory agreement on the unified employment of airpower. The agreement divided airpower into separate geographic areas for command and control. Ultimately, the Air Force and the Navy ran their own, separate air operations within their respective route packages. This command arrangement created air employment problems, similar to those encountered in the Korean War. While the Air Force and Navy attempted a compromise command and control structure, the Route Package System was not the most effective command relationship for directing both forces toward a common objective and robbed airpower of its inherent flexibility and ability to create synergistic effects.

Khe Sanh

The Battle of Khe Sanh stands in stark contrast to the previous examples of the ineffective application of airpower. Khe Sanh was a U.S. Marine Corps fire support base in northern South Vietnam surrounded by mountains and dense jungle. It was the starting point for long-range search and destroy and reconnaissance patrols. For all practical purposes, Khe Sanh was totally dependent upon air support for its existence. In the fall of 1967, the North Vietnamese Army surrounded the Khe Sanh encampment of 6,000 Marines with 15 to 20,000 troops. To North Vietnamese General Giap, Khe Sanh was a politically significant target. Giap decided Khe Sanh would be the pivotal battle that would drive the Americans out of South Vietnam much like Dien Bien Phu had driven out the French in 1954.

Air Power at Khe Sanh

Despite their numerical superiority and incredible tenacity, the North Vietnamese were unable to prevail. The besieged Marine firebase was supported by OPERATION NIAGARA in early 1968, which supplied 24,000 tactical sorties and 2,700 B-52 sorties. Airpower dropped over 110,000 tons of bombs on the enemy over a two-month period. Additionally, Seventh Air Force Commander, General William Momyer, was made the single manager for air. Under this centralized control concept, Momyer made effective use of all Air Force, Navy, and Marine tactical air units in support of Khe Sanh. The North Vietnamese were forced to lift the siege in March 1968. The successful outcome of the battle of Khe Sanh can be attributed directly to adherence to both the doctrine of centralized command and control of airpower, and the proper employment of coordinated, integrated airpower.

Linebacker II

OPERATION LINEBACKER II is another example of the effective application of airpower during Vietnam. To force a settlement of the Vietnam War, President Nixon directed an all-out air campaign against North Vietnam's heartland on December 18th 1972. The President's objectives concentrated on using all forms of airpower to strike at vital power centers to cause maximum disruption in the economic, military, and political life of the country. The result was an intensive day/night air campaign known as

LINEBACKER TWO. The air campaign included strikes using precision-guided weapons, neutralization of area targets by B-52 aircraft, and suppression of enemy air defenses by Seventh Air Force and the Navy's Task Force Seventy-Seven aircraft. Coordination of these missions allowed LINEBACKER TWO to succeed against the world's most extensive integrated air defense system. After eleven days of persistent and concentrated bombing, the North Vietnamese sought a cease-fire and returned to discussions of peace. While ultimately successful, the operation was not without its problems. The Navy and the Air Force achieved close coordination throughout the campaign, but true centralized control of airpower never existed. Nonetheless, LINEBACKER TWO'S persistent and massive application of airpower successfully supported the President's political objectives.

Post Vietnam Assessment
After the Vietnam War, Air Force doctrine retained a heavy emphasis on nuclear deterrence due to the continuing Soviet strategic threat. As with the Korean War, Vietnam offered a vast experience for analyzing the role of airpower during conventional warfare. But, instead of examining that relationship, Air Force doctrine experts chose to retain the familiar issues of nuclear warfare. However, one service component did capitalize on the lessons of Vietnam. Army doctrine experts undertook an extensive reexamination of their doctrine. The Army's priority shifted back to Europe and the difficult problem of how to stop the Soviet and Warsaw Pact threat on a European battlefield. Out of that re-examination arose a concept called Airland battle.

Airland Battle
 The joint nature of the AirLand Battle concept required coordination between the Army and the Air Force. This coordination was established through a relationship between the Air Force's Tactical Air Command, or TAC, and the Army's Training and Doctrine Command, or TRADOC. During the 1980s, this relationship resulted in the Army's doctrine of AirLand battle being elevated as the Air Force's de facto doctrine and strategy for employing airpower in conventional conflicts. Under this doctrine, the Air Force was viewed as having a supporting role in conventional warfare. Its land-centric focus relegated the Air Force to a position of exclusively providing support to surface forces. The Air Force did not articulate the contributions of airpower at the operational level of war. This failure to address airpower's capabilities across the spectrum of conflict, left the Air Force in the role advocated by many ground commanders in the 1930s.

Impact of Airland Battle
The relative cohesion and strength of the Army-Air Force partnership from the end of Vietnam through 1986 was based on a number of factors. First, both services were influenced by the unifying effect of the NATO defensive mission in Europe. Second, Air Force leadership believed in supporting the Army in conventional warfare. Last, the Army had a clear vision of how it wanted to fight a future war—and the Army realized that Air Force support was absolutely essential for winning future wars. The Army, to its credit, articulated its doctrine for the operational level of war. This doctrine influenced the development of Air Force planning documents, which contained a wealth of

information on AirLand Battle targeting. Unfortunately, the documents did not mention principles or guidelines for strategic attack in conventional warfare. Remember, strategic was synonymous with nuclear in many Air Force thinkers' minds. Throughout the 1980s, the Air Force had a myopic vision of conventional warfare that totally focused on supporting the Army. Air Force doctrine failed to sufficiently outline that while support of the ground commander was vitally important, it was only one element in the versatile application of airpower.

Operation Eagle Claw
In 1980, President Carter authorized OPERATION EAGLE CLAW, a joint military service operation, to rescue hostages at the American embassy in Iran. The plan called for resources from all four services, including Air Force C-130 and C-141 aircraft, Navy helicopters, and Army Delta Force Rangers. The mission was overly complex and lacked an overarching organizational structure to assume command and control of operational forces. These factors, coupled with a lack of planning and other operational mishaps encountered during the employment phase, led to the mission being aborted at the initial landing site that was designated as "DESERT ONE." The Air Force was doctrinally unprepared to enter into the complicated joint and conventional operations posed by OPERATION EAGLE CLAW. The failed operation raised serious doubts regarding the ability of the Air Force and the other services to effectively integrate as a joint team.

Operation Urgent Fury
OPERATION URGENT FURY, a U.S. military effort to rescue and evacuate endangered citizens on the Caribbean Island of Grenada, happened three years after OPERATION EAGLE CLAW. The Air Force found itself engaged in another joint service operation for which it was doctrinally unprepared. Although the joint task force was ultimately successful in securing the island, there were major operational problems in the integration of air and ground forces. In retrospect, it appeared that some of the same problems of command, control, communications, and intelligence that plagued the Iranian hostage rescue attempt, also surfaced in Grenada. Specifically, service doctrine did not address the areas of joint operability. As a result of the outcome of the operations in Iran and Grenada, military doctrine writers faced the task of addressing the problems associated with organizing and employing military forces under a joint command.

Goldwater-Nichols 1986
Both OPERATION EAGLE CLAW and OPERATION URGENT FURY demonstrated the problems of joint operations within the U.S. military. The Goldwater-Nichols Act of 1986 was the mandate for the military services to collaborate on developing joint doctrine for the integrated employment of joint military operations. The doctrinally oriented Army was the first service to embrace joint doctrine. The result was a land-centric approach to warfare. For the Air Force, this initially meant that airpower was viewed as a support mechanism to the land commander on the battlefield. In spite of the land-centric focus, the Air Force did make some in-roads in the establishment of joint doctrine. Most

notable was the emergence of the concept of the Joint Force Air Component Commander or JFACC. The JFACC concept provided a framework for integrating and employing airpower from all service components under a unified organizational structure. This concept also had a significant impact on the development of air strategy and the conduct of joint air operations. The JFACC concept is a subject for another lesson. The Goldwater-Nichols Act had a far-reaching effect on the Air Force. This legislation was the impetus for moving the Air Force away from the era of doctrinal excursions toward employment as a decisive contributor in joint operations.

Summary

A review of 40 years of Air Force doctrine from the end of World War Two up to the 1990s illustrates the problems the Air Force encountered in adhering to sound doctrinal principles. Without guidance and lacking general agreement on the employment of airpower, the Air Force failed to adhere to the principles of airpower thought espoused by the Air Corps Tactical School. Following World War Two, the national leadership and, consequently the Air Force, focused almost solely on the deterrence of nuclear war, and if necessary, the employment of nuclear weapons. National policy and military budgets focused on nuclear war, and Air Force doctrine of the time mirrored the evolving strategy associated with nuclear warfare. As a result, the Air Force was not prepared for the limited conventional wars that erupted in Korea and Vietnam. In addition, the focus on nuclear deterrence failed to prepare the Air Force for conducting joint military operations. These and other factors ultimately led to the "excursions from airpower doctrine" examined in this lesson.

 Ultimately, the Air Force must stand on its doctrine as the basis for the employment of airpower. Theory and doctrine provide the foundation of how airpower works and why airpower is important to those who must support it. Today, Air Force officers must bring an air and space perspective to the joint environment. Air and space power doctrine forms the basis of that perspective and stipulates that air and space forces, if used in certain ways, can bring forth more rapid or less expensive victory in war, than if used in other ways.

Doctrine Strategy Link

Introduction
In his book On War, Carl von Clausewitz described war as the means of reaching political objectives. The means can never be considered in isolation from the purpose. Modern political objectives are achieved through certain strategies. Modern warfare is also guided by certain doctrine. Thus, according to Clausewitz, strategies are reached through the appropriate application of doctrine. Likewise, it can be stated that doctrine should never be considered in isolation from strategy.

Lesson Objective
You have been exposed to the concept of doctrine in past lessons. This lesson presents a more detailed discussion of doctrine and its relationship to strategy.   The lesson's objective is for you to comprehend the relationship between doctrine and strategy.   You will achieve this objective by gaining a comprehension of how doctrine influences strategy and ultimately the employment of air and space power.   You will also gain a comprehension of the role of strategy in the employment of air and space forces.   Finally, you will gain a comprehension of the interrelationship between strategy and doctrine.

Overview
To help you gain an understanding of the doctrine-strategy link in today's national security environment, this lesson first covers the concept of doctrine as it exists in current Air Force documents.   Next, the lesson presents the concept of strategy as it exists on the national, joint military, and individual service levels.   Finally, the lesson provides examples illustrating the dynamic relationship between doctrine and strategy.

Doctrine
Air Force doctrine is a body of central beliefs representing a distillation of best practices concerning the employment of air and space power. It guides the employment of air and space force capabilities in support of national objectives.   Doctrine is generally derived from past experience, but written with an eye toward future changes. Although authoritative in nature, doctrine is a guide--not a prescription--and requires judgment in its application. Based upon history, experience, exercises, war games, and critical analysis, military doctrine describes the best ways to employ forces to accomplish military goals.

Three Levels of Doctrine
The Air Force develops doctrine at three levels; basic, operational and tactical. Basic doctrine includes fundamental principles, while operational doctrine includes concepts of organization, support, and acquisition, with tactical doctrine describing tactics, techniques, and procedures. There are specific documents that guide the employment of air and space forces at each level. These documents are consistent with and complement joint publications. Likewise, they conform to and support strategic planning documents.

Basic Doctrine
Basic doctrine is expressed in Air Force Doctrine Document One, titled, "Air Force Basic Doctrine." This document establishes guidelines for employing air and space forces across the full spectrum of military operations. It forms the basis from which air commanders plan and execute assigned missions. AFDD 1 further provides the Air Force perspective to the joint world. Because of its fundamental and enduring character, basic doctrine provides broad and continuing guidance on the organization and employment of air and space forces.

Operational Level Doctrine
Air Force Doctrine Document Two, titled, "Organization and Employment of Aerospace Power" is the Air Force's capstone operational level doctrine publication. It builds on the fundamentals in AFDD 1 and outlines the organization and employment of air and space forces.   AFDD 2 also provides an overview of how the Air Force transitions from peacetime to contingency operations.   It describes how the Air Force organizes itself for theater operations and presents forces for joint operations.   The document also describes how the Air Force plans, executes, and assesses the success of operations. AFDD 2 is the capstone document of a set of sub-documents, the 2-dash series, that provide detailed operational level guidance in all functional and support areas. These documents are available on the Internet at the Air Force Doctrine Center.

Tactical Level Doctrine
Tactical level doctrine is contained in the Air Force's Tactics, Techniques and Procedures Three-level Series. These documents evolved from the old Multi-Command Manual 3-1 and 3-3 series and deal with specific weapons systems.   Tactical doctrine considers tactical objectives and operational conditions and describes how weapons systems should be employed or operated to accomplish those tactical objectives.

Strategy
Strategy differs fundamentally from doctrine even though each is necessary for employing military forces. Strategy originates in policy and addresses broad objectives and the plans for achieving them. Military strategies are designed to achieve military objectives that lead to the desired political objectives of conflict.   Doctrine should play a vital role in formulating strategy because it suggests, based on the experience of past strategies, the best way of achieving military objectives with the resources available.

Strategy Hierachy
Like doctrine, strategy is developed at differing, but related levels. At the highest level is national security strategy. Strategy at this level is based on national security objectives and employs all instruments of national power including economic, political, ~~and~~ military, <u>and informational</u>.   From the national security strategy, the national military strategy is developed to describe the use of the military instrument of power. Strategy at this level involves coordinating the development, deployment, and employment of military forces to achieve national security objectives. Since we fight as joint forces, individual service strategies are unnecessary. The services and joint staff do, however, formulate

statements to describe joint and service visions and operational concepts to support the national military strategy.

National Security Strategy

The current National Security Strategy is contained in the document, The National Security Strategy of the United States of America , dated September 2002. The National Security Strategy, or NSS, reflects the policies and policy objectives of the administration. The 2002 NSS reflects the ideas of defending the peace, preserving the peace, and extending the peace; and provides eight specific national security objectives. Several of these objectives: strengthening alliances to defeat global terrorism, preventing threats from weapons of mass destruction, and transforming national security institutions directly impact military operations. Other NSS objectives will likely involve military forces as well.

National Military Strategy

Developed from the national security strategy, the national military strategy reflects and supports the policies and visions of America's leaders. The current version of national military strategy is entitled "Shape, Respond, Prepare Now: A Military Strategy For A New Era."   It identifies two national military objectives: to promote peace and stability; and, when necessary, to defeat adversaries. Generally, a new National Military Strategy is developed following a major revision of the National Security Strategy.

Joint Force Operations

The armed forces advance the objectives of the National Military Strategy through joint force operations. In implementing the National Security Strategy and National Military Strategy, the armed forces must remain globally engaged to shape the international environment and create conditions that are favorable to U.S. interests and global security.   Joint forces must also respond to the full spectrum of crises in order to protect our national interests.   Finally, the armed forces must take steps to prepare now for an uncertain future.

Joint Vision 2020

While not an actual strategy, joint and service visions provide statements of how forces will prepare to meet future challenges. As mentioned earlier, joint and service visions are derived in support of the National Military Strategy. The current joint vision statement issued by the Chairman of the Joint Chiefs is called Joint Vision Twenty-Twenty. It provides guidance and direction to the armed services for preparing for the challenges of the 21st century. JV2020 states that the overall objective of the continuing transformation in America's Armed Forces, is the creation of a force that is dominant across the full spectrum of military operations.

Full Spectrum Dominance

Joint Vision Twenty-Twenty builds upon and extends the conceptual template established by Joint Vision Twenty Ten. Joint Vision 2010 introduced a new conceptual framework for military operations.   The new concepts were dominant maneuver, precision engagement, full-dimensional protection, and focused logistics. Bound

together by information superiority and innovation these concepts remain valid, and enable joint and coalition forces to dominate the full spectrum of military operations.

Air Force Vision
Each service has its own roadmap as to how it will support and embody the directions contained in higher-level strategic documents. The Air Force's vision is detailed in Air Force Vision 2020: Global Vigilance. Reach and Power.   This document outlines the mission statement of today's Air Force, "To defend the United States and protect its interests through aerospace power."   Included in Air Force Vision twenty twenty is a discussion of the foundation of the Air Force--its people and core values, the domain in which the Air Force operates, the method of employing as an Expeditionary Air and Space Force, the building blocks of the Air Force--its distinctive capabilities, the approach for the future--innovation and adaptation, and our commitment toward these future innovations--keeping the trust.

Doctrine Strategy Link
To recap, strategy originates in policy and addresses broad objectives and plans for achieving those objectives.   Military strategy describes how forces will be employed to accomplish national political goals and military objectives.   Doctrine, on the other hand, evolves from military theory and experience and describes best practices in employing military power. Air and space doctrine is a statement of officially sanctioned beliefs and warfighting principles that describe the best methods of employing air and space forces in military operations. When devising strategies for employing air and space power, military leaders should consider the principles and guidelines contained in official doctrine. The proper alignment of strategy with doctrine results in the effective use of air and space power.

Rolling Thunder
For an example of the important relationship between doctrine and strategy, consider the Rolling Thunder bombing campaign of the Vietnam conflict. The overall national objective in Vietnam was to negotiate a peaceful settlement to the war. Rolling Thunder was executed as one of the military strategies to reach that objective. It called for a gradually escalating aerial bombardment of North Vietnamese targets to demonstrate US resolve and convince the North of the futility of continuing the war. The actual military objectives were poorly defined, but it was hoped that striking military targets would reduce the North's war-making capabilities. The tactical implementation of the campaign was dependent upon weekly policy decisions delivered from Washington. Doctrine of the time was based almost entirely on deterrence and nuclear warfighting, and provided little guidance for decisions in a limited conventional war. This lack of doctrine handicapped the military leadership in influencing the chosen strategy. Hence the bombing campaign was executed to reflect changing policy decisions rather than in pursuit of defined military objectives to achieve political end states.

Linebacker II
Comparing the Rolling Thunder campaign to the later Linebacker Two Operation reveals a marked contrast in the effectiveness of the two bombing campaigns. During

Linebacker II, many of the policy constraints were lifted allowing for greater military influence upon the military strategy. Consequently, Linebacker II achieved many of its military objectives, which resulted in a realization of policy goals as well. In spite of deficiencies in the doctrine of the time, Linebacker II was more firmly rooted in best practices than had been Rolling Thunder.   The Linebacker II and Rolling Thunder Operations demonstrate the consequences of not having a sound doctrine in executing military strategy. The Air Force doctrine manual of 1964 had no references to the principles of war, and the Rolling Thunder Operation reflected a lack of these guiding principles. The lack of doctrine also seems to have played a significant role in producing an unsound and unachievable strategy.   It was not until 1975 that conventional warfare gained any significant attention in Air Force doctrine, and the principles of war were once more included in the doctrine manual.

Operation Eldorado Canyon
An example of the proper relationship between doctrine and strategy rests in Operation Eldorado Canyon.   During this event, the national security objectives centered on sending a message to the Libyan leadership, and to the world, that the U.S. would not stand for acts of terrorism against its citizens.   To support this objective, the military developed a strategy grounded in doctrinal principles. This strategy called for demonstrating U.S. military capability and resolve to retaliate against terrorist acts.   The resulting joint air strategy consisted of precision air attacks on Libyan targets with links to terrorist activities.   This strategy was based on tactical-level doctrinal principles. Those principles guided the selection and employment of the weapon systems most suited for fulfilling the military strategy of striking against terrorist acts.

Effective Linkage
The outcome of Operation Eldorado Canyon demonstrates the effects of properly linking sound doctrine to executable national, military, and joint air strategies. The military strategy had clearly defined objectives that directly supported national security objectives. The air operation was conducted according to basic doctrinal principles and following guidelines of published Air Force doctrine. The result was a successful military air operation that produced the effects sought by national leadership. In this example, the proper link between doctrine and strategy resulted in the effective employment of air and space forces.

Forces of Change
The relationship between doctrine and strategy is extremely dynamic. Vietnam has shown the peril of developing strategy without due regard for doctrinal issues. On the other hand, the whole purpose of doctrine is to codify a set of best practices for achieving the goals of strategies. Our Cold War doctrine was developed to support a Cold War strategy. Doctrine cannot exist in isolation from strategy.
There are many forces of change that affect the evolution of this dynamic relationship between doctrine and strategy. Certainly politics and social pressures can dictate military practices in conflict with established doctrine. Budget considerations may also cause political guidance that deviates from sound doctrinal practices.   Technological changes affecting our capabilities or the threats we face can also upset the alignment of

strategy and doctrine. When misalignments occur, military leaders are responsible for delineating the consequences to political leaders. It is a near certainty, however, that if a selected strategy is not linked to sound air and space doctrine, then air and space forces are likely to be much less effective in achieving strategy objectives.

Summary
This lesson looked at war as one means of reaching national policy objectives. Victory in war is not measured in casualties inflicted, battles won or lost, or in territory occupied, but by whether or not the political objectives were achieved. The overarching objective of any military action is the support of national political objectives. When considering the employment of military forces, one must be aware of the dynamic relationship between doctrine and strategy. Effective and ineffective strategies produce lessons learned that should then be incorporated into doctrine as either best practices or practices to avoid. Doctrine then becomes the repository of those lessons learned to guide and shape future strategies.   Compounding the dynamics of the doctrine strategy relationship are outside actors and factors that shape and influence both strategy and doctrine in unique ways. The effective employment of air and space forces must consider the proper relationship of strategy to doctrinal guidance.

Principles of War

Introduction
General Ferdinand Foch, Commander of the Allied Armies in World War One, explained the importance of studying the history of warfare. As an airman, you are entrusted with the role of properly and effectively applying air and space principles in the accomplishment of national military strategy. To do this, you must study the historical application of air and space power and understand its advantages and limitations. This lesson, titled, "The Principles of War" will help you gain that understanding.

Lesson Objective
The objective of this lesson is for you to comprehend the Principles of War as expressed from the perspective of an airman, or more specifically, a United States Air Force airman. At the end of this lesson, you will be able to explain the Principles of War as they pertain to the application of air and space power. You will also be able to apply your understanding of air and space power to future technological advancements and changes in employment concepts.

Overview
The lesson begins by covering the historical evolution of the principles of war. Next you will look at the different perspectives of the principles from the joint and Air Force positions. Finally, you will examine some historical examples of the application of the principles of war from the airman's perspective.

Principles of war Joint vs Airman's view
Joint Pub One refers to the principles of war as "the enduring bedrock of US military doctrine." Air Force Basic Doctrine acknowledges that the principles of war apply equally to all of the US armed forces. Airmen must develop an understanding of the principles from an airman's point of view because air and space forces provide unique capabilities through operations in the third dimension.

Principles of War –History-ancient era
The principles of war are not new concepts. As early as Sun Tzu's work, "The Art Of War", the concepts that evolved into principles were taking shape. Although Sun Tzu never addressed specific principles, his concepts of deception, freedom of action, adaptability, and flexibility can be directly related to modern principles of war. To view a description of a concept, place you mouse cursor over it.

Principles of war –Napolenic Era
The Napoleonic era saw the science of land warfare taken to new heights, both ideologically and technologically. Antoine Henri Jomini was the first to express the idea that a small number of principles should guide the commander's efforts on the battlefield. Although he never explicitly identified the general principles to which he referred, Jomini articulated two basic concepts which have been taken as principles. Jomini's thoughts on freedom of maneuver to bring masses of one's own troops against fractions of the enemy's and his thoughts on the ability of a military power to strike in the

most decisive direction can both be linked to modern-day principles of war. To view a description of a concept, place your mouse cursor over it.

Principles of war-19th century

Carl von Clausewitz has been erroneously credited with the development of an immutable list of principles . In fact, even in his book, <u>The Principles of War</u>, he warned against a reliance on principles, but rather presented them as tools to "stimulate and serve as a guide for reflection." To view a description of a tool, place your mouse cursor over it.

Principles of war-20th Century

In the years immediately following the end of World War One, much of the academic thought regarding the principles of war was formalized. The efforts of Major General J.F.C. Fuller evolved into a list of principles that was published in the British Field Service Regulations, Volume 2, in 1920.

POW - current era

Through modest evolution, the principles shown here have emerged as the accepted standards for the U.S. joint military. These principles are detailed in Joint Pub 3-0. As broad guidelines for employing military force, the principles of war apply equally to all U.S. armed forces.

The Principles

You will now see a brief description of what Joint Pub 3-0 and Air Force Doctrine Document One, or AFDD 1, say about each of the principles of war. Pay attention to how AFDD 1 provides an air and space perspective of each principle and how the air and space perspective complements or contrasts with the joint perspective. For a more detailed examination of each principle you may link to the original documents.

Objective

The joint perspective of the principle of objective is to direct operations toward properly defined objectives. It is critical that each objective–either tactical or operational—have a strategic purpose. Unlike surface forces, air and space forces do not need to first achieve tactical objectives before pursuing operational or strategic objectives. From the airman's perspective the principle of objective shapes priorities to allow air and space forces to concentrate on theater-level priorities.

Offensive

The principle of the offensive is about seizing, retaining, and exploiting the initiative. Offensive actions are the best way to maintain freedom of action and achieve decisive results. Even defensive operations must be prosecuted with an offensive spirit. Due to their inherently offensive nature, air and space forces allow the joint force commander to seize the initiative by dictating the timing, place, purpose, scope, intensity, and pace of battlespace operations. Offensive actions against operational or strategic objectives, force the enemy to react rather than act, thus denying the enemy the offensive, and shaping the remainder of the conflict.

Mass
The joint interpretation of the principle of mass is the ability to concentrate combat effects at a decisive place and time. Surface forces typically achieve mass by concentrating forces–synchronizing their operations in space and time and sustaining them until the desired effect is achieved. Airmen emphasize the fact, which joint doctrine recognizes, that mass is an effect, not just overwhelming quantity. With recent advances in precision weaponry and command and control, air and space forces are uniquely capable of using their speed, range, and flexibility to mass effects, either lethal or non-lethal, anywhere in the world from widely dispersed launch locations.

Economy of Force
Economy of force concerns the allocation of minimal essential combat power toward achieving secondary efforts. This preserves combat power to mass elsewhere at a decisive time and place. From the point of view of the airman, economy of force demands a rational use of critical resources on properly selected objectives.   The misuse or misdirection of air and space forces on ill-defined objectives can reduce their contribution even more than enemy actions.

Maneuver
Maneuver is normally viewed in relation to the enemy's fielded forces. The goal of maneuver is to gain a positional advantage from which to deliver fires. The flexibility and versatility of air and space forces allow the simultaneous application of mass and maneuver to strike strategic or operational centers of gravity anytime, anywhere, and from any direction. This forces the enemy to defend everywhere, all of the time.

Unity of Command
The principle of unity of command, from both the joint and air and space perspectives, calls for unified efforts that are directed and coordinated toward pursuing common objectives. Because air and space power is the product of multiple capabilities, centralized command and control, as implemented through the Joint Force Air Component Commander or JFACC concept, is essential to effectively fuse these capabilities. The theater-wide capabilities of air and space forces can best be exercised through the integrating function of centralized command and control by an airman.

Security
The principle of security focuses upon the areas of force protection and risk management. Keeping our forces secure, increases their combat power and preserves freedom of action. The range and speed of air and space assets uniquely enhance their ability to strike from beyond the enemy's reach. Not only can they strike from an extended range, air and space assets can also distribute data and provide command and control across a worldwide span to reduce their vulnerability.

Surprise
Surprise leverages the security principle by attacking at a time or place, or in a manner for which the enemy is not prepared.   Surprise can shift the balance of combat power

leading to success ~~exceeding~~ that exceeds the effort expended. Air and space forces can more readily achieve surprise due to their range, speed, flexibility and versatility. Air and space forces can also enhance and empower surface forces to achieve overwhelming surprise.   The rapid global reach of airpower allows surface forces to reach foreign destinations quickly and seize the initiative through surprise.

Simplicity
Simplicity in the joint arena calls for making all plans and orders as clear and concise as possible. A simple plan is more likely to endure the fog of war and be successful. From the airman's perspective, simplicity is crucial for decentralized execution or allowing subordinate commanders the freedom to creatively execute the operational plan within given general guidelines. Simplicity begins with unambiguous organizational and command relationships that can develop straightforward plans.

Historical Applications
In the introduction to Gen Foch's book, "The Principles of War," de Morinni reflected on the perils of concentrating on the methods of trench warfare during the First World War. Today, some critics argue that joint doctrine may be concentrating too heavily on two-dimensional maneuver warfare like that used during the 1991 Gulf War. The consequences of ignoring the proper future application of air and space power could be just as disastrous as those endured in the trenches of northern France. Take an opportunity to study a few historical examples of the uses and misuses of air and space power and consider how some of those lessons might apply today.

Combined Bomber Offensive
As you will recall from previous lessons, ideas about the decisive use of air power were developed at the Air Corps Tactical School at Maxwell Field during the interwar years. The first real test of those ideas came in World War Two during the European combined bomber offensive.   The plan, detailed in AWPD 1, called for air attacks against the German war-making infrastructure which included the electric power system, transportation system, oil and petroleum production facilities, and public morale. The concept behind the combined bomber offensive was a solid application of the principles of objective and offensive.

CBO-fighter Escorts
The success of the combined bomber offensive was made possible by changes in employment concepts and technological advancements.   The introduction of effective, long-range bomber escort enabled air power to neutralize the German Air Force through counter-air attacks and interdiction deep into German territory. This campaign effectively utilized the principles of maneuver and surprise.

CBO-Security
By attacking submarine bases, surface sea craft, and invasion ports, the combined bomber offensive was able to safeguard allied resources from German attack. This exemplifies how the principle of security is enhanced by the use of air power.

Vietnam Rolling Thunder
The Vietnam War contained many examples of the proper application of airpower, and a few of its misapplications. In 1965, Operation Rolling Thunder was one of the prime examples of the misapplication of air power. This campaign was an attempt to stabilize the situation in Southeast Asia. Using progressive air strikes against carefully selected and controlled targets, the objective was to persuade the North Vietnamese government that it could not win the war. The results of the offensive actions had just the opposite effect. These actions caused a hardening of enemy defenses, rhetoric and attitudes against U.S. involvement in the war. When the interim results were analyzed in the spring of 1965, the U.S. strategy was modified to gradually increase the tempo of attacks. The North Vietnamese responded with a complementary escalation in their offensive activity. The misapplication of air power centered on the improper choice of interdiction targets and the inability to deliver the decisive blows required to achieve the desired operational and strategic effects.   The restrictive planning and close control exercised by the administration were also detrimental to U.S. morale and spirit which only intensified the sentiments of the north.   Offensive and objective were two of the principles misapplied during the ROLLING THUNDER campaign.

Vietnam – C2
The command and control of air activities during the Vietnam War could not have been conducted in a more disjointed fashion.   Each service controlled its own sectors of air space in North Vietnam and Laos through the Route Package System. As you may remember from a previous lesson, the Military Assistance Command-Vietnam, MACV, controlled the air war in route pack one. The Navy, through PACfleet, controlled the air war in route packs two, three, four, and six b. Pacific Air Forces, PACAF, controlled air activities in route pack five and six a. The widespread use of long range bomber forces was controlled by Strategic Air Command.   The first point at which the planning and execution chains of command joined was at the Joint Chiefs of Staff. The problems this caused with regard to the principles of unity of command and economy of force directly contributed to the current joint operations doctrine put into law by the Goldwater-Nichols Act of 1986.

Vietnam-Linebacker II
In contrast with the mistakes of the Rolling Thunder campaign, the conduct of LINEBACKER TWO highlights the proper use of airpower. The North Vietnamese had shifted their strategy to that of a conventional ground war. The objective of linebacker two was to end the war by demonstrating that the conflict was not sustainable, a subtle but significant change in policy. By finally being able to take the damage and destruction of war to the heart of the country, especially Hanoi and Haiphong, the air war had effects that the ground campaign was never able to carry out. This is a positive example of air power employed with regard to the principle of objective. Only after the Vietnamese air defense system was neutralized, and bombing missions were conducted virtually unopposed, did the North Vietnamese leadership finally realize that they were better off returning to the peace negotiations. This application of air power illustrates the ability of air and space forces to exercise the principles of mass and offensive action.

Desert Storm
During Desert Storm, two technologies, stealth and precision guided munitions, had a significant impact on military operations. The Joint Force Commander was able to strike an entire set of operational and strategic targets, a task that was heretofore technically impractical.   For the first time, U.S. armed forces were able to use the concept of parallel warfare, thereby eliminating the need for sequential attacks. The F-117s were able to go after any target deemed necessary, to include communication nodes, electrical grids, command and control centers, and transportation systems. The Joint Force Commander was able to target for effect, choose the decisive system, and inflict the desired destruction or damage. In one way or another, every principle of war is embodied in stealth and precision strike capabilities. Most significant are the principles of objective, mass, economy of force, and security. By striking deep and completely avoiding the well-entrenched ground forces, the F-117s shaped the battlefield in a way that may never be fully appreciated.

Stealth and Precision
Our capabilities in stealth and precision have steadily progressed. In World War Two, large numbers of aircraft had to concentrate in a single area to produce any effect. This was mass in the traditional sense. In Vietnam, improvements in precision were made but it still required a large number of aircraft to destroy one target. In Desert Storm, stealth was added and for the first time, mass was redefined. You could now achieve desired effects on multiple targets without large numbers of aircraft. Recent operations such as Iraqi Freedom demonstrated how stealth and precision guided munitions coupled with advances in command and control can put any target in an entire country at risk within minutes. Modern air and space operations give the principles of objective, mass, and economy of force a whole new meaning. The effect of one, two-thousand pound bomb down the airshaft of a command and control bunker could only be dreamed of in the days when massive bomber formations conducted so-called "high altitude daylight precision bombing." Requiring fewer aircraft for a given effect means simpler plans and operations as well as limiting our exposure to risk, a primary concept in the principle of security. Stealth also enhances security, makes surprise ~~almost~~ <u>nearly</u> inevitable, and allows unfettered maneuver over, around, or through enemy defenses. It's important to note that while technology has improved, the basic principles of waging war have remained the same.

Space Assets
Space assets allow the US to monitor activities throughout the world. This is vital for the protection of strategic interests. In many parts of the world, the U.S. is unable to deploy a significant physical presence. For instance, the U.S. played a large role in the U.N. treaty compliance inspections in Iraq after Desert Storm, but was allowed only small teams of inspectors. The placement of troops in Bosnia was greatly restricted by politics and physical security concerns. Furthermore, the Rwandan refugee migration had foreign policy implications but there was virtually no U.S. military presence in the region.   Space assets give the U.S. unique capabilities for surveillance, reconnaissance, communications, and navigation across the globe. Space-based

assets allow direct access to objectives exactly where needed, whether during combat, operations other than war, or peace operations. Space assets do the work of literally thousands of land-based systems at a higher level of fidelity and without putting lives at risk.   The security of overhead systems, at least for the present, is obvious. However, as other nations make technical advances, more effort to secure space-based systems will be needed. Objective, economy of force, and security are but a few of the principles of war that space assets exemplify in supporting national and military strategy.

Summary
The principles of war apply equally to all of the U.S. armed forces. As members of the Air Force component of the joint team, airmen should appreciate how these principles apply to all forces but they must fully understand them as they pertain to air and space forces. As an element of doctrine, the principles of war are guidelines that commanders can use to form and select courses of action. Of course, even valid principles are no substitute for sound, professional judgment —but to ignore them totally is equally risky.

Tenets of Air and Space Power

Introduction

Air and Space power is fundamentally different from either land or sea power, and its employment is guided by certain axioms that are different from those of surface forces. Those axioms are called the seven tenets of air and space power. They are the guiding truths of air and space power employment and amplify the nine principles of war by providing specific considerations for employing air and space forces. To intelligently advocate and articulate air and space power, airmen must comprehend the proper application of the seven tenets of air and space power. The tenets not only reflect the lessons of air and space operations over the history of powered flight, they also represent the current understanding of the nature of air and space power.

Lesson Objective

The objective of this lesson is for you to comprehend the seven tenets of air and space power as they relate to air and space operations. At the end of this lesson, you should be able to describe the guiding truths embodied in each of the seven tenets. In addition, you'll be able to explain each tenet as it relates to the application of air and space power.

Overview

To help you understand the tenets of air and space power, this lesson will first briefly examine the advantages of air and space forces over surface forces. Then, it will present an in depth description of each of the seven tenets. Since the tenets of air and space power reflect the lessons of air and space operations over the history of powered flight, the lesson will also provide historical examples of the application of each tenet.

Air and Space Power Characteristics

Air and Space power operates in three dimensions, thus enjoying a qualitatively superior form of freedom of maneuver to that of surface forces. This freedom of operation in the air and space environment allows exploitation of speed, range, maneuverability, and elevation to a greater degree than that afforded by surface forces. Unimpeded by natural barriers encountered on land and water masses, air and space forces can rapidly conduct operations over great distances, move in any direction, and enjoy multi-dimensional maneuvering.

The Seven Tenets

Since the early days of powered flight, airmen have theorized about air and space power and its employment in warfare. Though living in different times, existing in different places, and facing different circumstances, aimen have recognized certain truths about air and space power which appear to be generally timeless and overarching. These truths have been validated by the decades of experience since World War I. We refer to these truths as tenets. As addressed in AFDD One, the tenets of air and space power are: centralized control and decentralized execution, flexibility and versatility, priority, synergistic effects, persistence, concentration, and balance.

Thoroughly comprehending each tenet enhances an airman's overall understanding of the employment of air and space power.

Centralized Control and decentralized Execution
The tenet centralized control and decentralized execution has been referred to as the "master tenet." In order to effectively integrate the theater-wide capabilities of air and space forces, they should be centrally controlled by an airman to achieve advantageous synergistic effects, establish effective priorities, capitalize on unique strategic and operational flexibilities, ensure unity of purpose, minimize the potential for conflicting objectives, and prevent air and space forces from being parceled out and thereby under utilized. In addition, the execution of air and space missions should be decentralized to achieve effective spans of control and to foster initiative, responsiveness, and tactical flexibility.

Applying the Tenet
Whereas centralized control allows establishment of theater priorities, ensures unity of purpose, and harmonizes objectives, decentralized execution enhances responsiveness and provides flexibility in executing the mission. Delegation of execution authority to responsible and capable lower-level commanders is essential and ensures effective span of control. Airmen must remember that centralized control and decentralized execution must be employed together. Employing one without the other may result in fragmented effort and possibly mission failure. Modern communications technology provides a temptation to increase the centralized execution of air and space power. Although several recent operations have employed greater degrees of centralized control, such command arrangements will not stand up in a fully stressed, dynamic combat environment, and should not become the norm for all air operations. A high level of centralized control results in a rigid campaign that is ultimately unresponsive to local conditions and lacks tactical flexibility. Next you'll look at several historical examples of the application of this tenet.

Example –North Africa
The notion of centralized control and decentralized execution first appeared in U.S. air power doctrine as the direct result of bitter experiences in World War Two. Following the landings in northwest Africa in late 1942, Allied airpower was parceled out in support of specific ground units. The individual ground commanders set the priorities for their air forces. This fragmentation of effort hampered the airmen from ever achieving air superiority, which of course, adversely affected their ability to provide effective support to ground units. This passage from FM 100-20 clearly states the lessons that were learned. Unlike the rest of the manual, this section was typeset in capital letters, apparently to impress its importance onto the reader.

Example –Battle of Britian
The Battle of Britain during World War Two is a fine, early example of the proper use of centralized control and decentralized execution. The RAF's command and control structure gave commanders at every level sufficient information and authority to make decisions and implement them. The structure was simple, secure, and based on the

principle of unity of command. At every level, from group through sector to wing and squadron, each commander knew which part of the Luftwaffe's attack was his responsibility. As an attack approached, information from radar and the Royal Observer Corps allowed fighter command to develop, at the appropriate level, a broad plan of action. Higher commanders delegated authority downward, giving subordinate commanders the flexibility to use their own initiative in attacking targets. Although the RAF command structure was a simple organization, it was effective enough to defeat the Luftwaffe.

Flexibility and Versatility
Although the concepts of the next tenet, flexibility and versatility, are often used interchangeably, the two are distinct in meaning. At the operational level, flexibility allows air operations to shift from one campaign objective to another, quickly and decisively. On the other hand, versatility of air and space power stems from the fact that it can be employed equally well at the strategic, operational, and tactical levels of warfare. The tenet of flexibility and versatility involves air and space power's ability to perform a variety of roles as the situation dictates. History is full of examples of the effective application of this tenet.

Multi Role Employment
The tenet of flexibility and versatility was demonstrated during the Vietnam conflict, through the multi-role employment of the B-52 heavy bomber. During Linebacker II , the B-52 attacks against Hanoi and Haiphong directly supported the attainment of strategic level objectives. At the operational level of war, B-52s interdicted logistics and supply routes along the Ho Chi Minh trail. In tactical battles, B-52s provided highly effective battlefield close air support, as close as 1,000 yards for example for the Marines defending Khe Sanh.

Example Parallel Operations
The most dramatic application of the tenet of flexibility and versatility is the conduct of parallel operations. AFDD-1 states the versatility of air and space power, properly executed in parallel attacks, can attain parallel effects which present the enemy with multiple crises occurring so quickly that there is no way to respond to all or, in some cases, any of them. Such was the case in the opening hours of Desert Storm. Targets related to multiple centers of gravity were attacked nearly simultaneously. The swift, massive, and precise application of air, space, and information power against strategic, operational, and tactical objectives induced shock which resulted in paralysis of the Iraqi military organization. This paralysis provided the leverage needed to dominate surface as well as air and space operations. Today, the B-2 has the capability of attacking multiple targets during a single sortie and the flexibility to change those targets during flight.

Priority
In spite of the fact that air and space power is flexible and versatile, there are seldom enough resources to satisfy all requirements at once. Therefore, commanders must prioritize objectives in order to maximize the impact of air and space power operations.

The tenet of priority is the next topic you will examine. Priorities for the effective use of air and space forces begin with the overall campaign objectives as established by the Joint Force Commander or JFC. Then, the JFC assigns specific objectives to individual component commanders. The Joint Force Air Component Commander, or JFACC, then takes the JFC-assigned objectives and translates and prioritizes them into air objectives. The tenet of priority requires that air and space forces must be applied where they can make the greatest contribution to the most critical JFC requirements.

Yom Kippur
The tenet of priority was properly utilized by the Israeli Air Force during the Yom Kippur War of 1973. On six October, Syrian and Egyptian forces simultaneously struck against Israeli frontiers. Egyptian forces crossed the Suez Canal and moved into the Sinai Peninsula while, to the northeast, Syrian troops overran Israeli-occupied positions in the Golan Heights. After initial Arab successes, the Israeli Defense Forces held their ground and by ten October counterattacked. The Israelis constantly shifted air and space power from the Sinai front to the Golan Heights front. The Israelis were able to successfully make those shifts, daily, to accomplish the highest priority objectives.

Synergistic effects
The proper application of priority for a flexible, versatile and coordinated force can produce effects that exceed the contributions of separately employed, individual forces. This type of outcome is the subject of the next tenet called "synergistic effects." Synergistic effects can be created internally within Air Forces or externally with surface forces. When applied in comprehensive and mutually supportive air operations, the functions of air and space power produce effects well beyond the proportion of each function's individual contribution to the campaign. Air and space operations can also be applied in coordinated joint campaigns with surface forces, with the goal of either enhancing or being enhanced by the effects of surface forces.

Enduring Freedom
An example of synergistic effect was demonstrated during Operation ENDURING FREEDOM. Separate command and control, intelligence, surveillance and reconnaissance, and strike assets were integrated into a theater-wide target kill chain leading to greater effectiveness than could have been achieved if these systems operated independently. The Combined Air Operations Center or CAOC in Saudi Arabia directed multiple air assets during a mission to find and destroy Taliban and al Qa'ida leadership facilities and personnel. Using their theater-wide perspective and centralized control of the battlespace, CAOC personnel tasked multiple ISR platforms, including JSTARS and Predator to find, fix and track a convoy of enemy targets to a compound. The predator maintained surveillance of the enemy while the CAOC re-tasked an AC-130 gunship operating in another part of the theater to move and engage the compound. By integrating the video feed from the Predator directly into the AC-130 cockpit, off limits targets were identified to minimize collateral damage while authorized targets were attacked by the gunship. Finally, the predator completed the cycle by providing real time damage assessment back to the CAOC.

WWII Control the Air

A more low-tech example of synergistic effect was demonstrated by the combined use of fighter and bomber aircraft during World War Two. American bombers attacked enemy aircraft production facilities as part of the campaign to achieve control of the air. Recognizing the threat posed by the bombers, Germany put its fighter force in the air to counter them. American fighters escorted the bombers to German aircraft-plant targets and destroyed the enemy aircraft that rose to attack the bombers. Freed from enemy fighter harassment, the bombers were more effective against the production sites than if they had flown alone. Additionally, the fighter-versus-fighter aerial engagements depleted the stockpile of German fighters. German fighters would generally decline engagements unless the high value bombers were present, so in a very real sense, the bombers made the fighters more effective. The effects of the combined fighter-bomber campaign were much greater than the effects of using the forces separately.

Persistence

Persistence, the next tenet, is a critical element in ensuring the prolonged effect of air and space operations. It is the intent of most modern air and space operations to quickly attain objectives through swift, parallel, and decisive blows to the adversary's operational and strategic centers of gravity. However, on some occasions, factors such as enemy resilience, effective defenses, or environmental concerns prevent U.S. forces from persisting. In many situations, air and space operations provide the most effective and efficient means for attaining national objectives. Therefore, commanders must persist in executing air and space operations and resist pressure to divert resources to other efforts, unless such diversions are vital either to attaining theater goals or ensuring the survival of an element of the joint force. Given sufficient time, a resourceful enemy can circumvent even the most devastating strategic effects. The goal is to persist in applying pressure and not allow the enemy that time.

Huels Synthetic Rubber Plant

An example of the failure to persist was the bombing of the synthetic rubber plant at Huels during World War II. After a devastatingly successful raid by allied bombers on 22 June, 1943, the plant was never retargeted for a major attack. This lack of persistence allowed German officials to repair the plant and return it to full production in six months. Experts suggest that three to five strong attacks would have completely eliminated the facility, and with it, thirty percent of Germany's synthetic rubber production capability.

Operation Desert Storm

The tenet of persistence was properly applied in OPERATION DESERT STORM. On the first night of OPERATION DESERT STORM, coalition forces conducted extensive coordinated attacks on the Iraqi integrated air defense system or IADS. U.S. Army attack helicopters and Air Force A-10s neutralized early warning and ground controlled intercept sites while Air Force stealth aircraft and Navy Tomahawk Land Attack Missiles attacked key command and control and communications sites. Other coalition aircraft conducted suppression of enemy air defense or SEAD missions from the outset of hostilities which, together with the other attacks on the Iraqi IADS, resulted in serious degradation of the overall system. Throughout the war, pressure was maintained on the

Iraqi IADS through a persistent SEAD program and direct attacks on enemy airfields, rendering the system ineffective.

Concentration

Throughout military history, leaders have sought to concentrate overwhelming power at a decisive time and place. The next tenet, concentration, concerns power or force brought together in time and space to achieve operational objectives. While the principles of mass and economy of force deal directly with concentrating power at the right time and the right place, concentration deals with directing efforts for the purpose of achieving overwhelming effect.

Battle of Britain

During World War Two's Battle of Britain, the German Luftwaffe's ~~failed to properly concentrate~~ lack of concentration of purpose ~~and~~ resulted in defeat. During the battle, Germany inadvertently struck London while targeting RAF airfields. In return, the RAF retaliated and bombed Berlin. Hitler, incensed about the RAF striking of Germany, changed his objective and bombed London. This change was a lack of concentration of purpose on the Luftwaffe's behalf and was a significant factor in Germany losing the battle.

Delibrate Force

An example of properly abiding by the tenet of concentration was seen in Bosnia in 1995. The Bosnian Serb defiance of U.N. mandates and the shelling of a refugee "safe area" in Sarajevo, which killed 38 civilians, prompted a U.N. and NATO retaliatory military response. The resultant air campaign, which consisted of NATO air and space forces, was called DELIBERATE FORCE. Through a concentrated application of air and space power, friendly forces hammered the Bosnian Serb military system. Precision weaponry destroyed Bosnian Serb heavy weapons, ammunition depots, and command and control bunkers. Three weeks of continuous air strikes finally drove the Bosnian Serbs to talk peace.

Balance

The next tenet, balance, means that commanders must balance; combat opportunity, necessity, effectiveness, efficiency, and their impact on accomplishing assigned objectives against the associated risk to friendly air and space forces. An air commander is uniquely—and best—suited to determine both the proper theater wide balance between offensive and defensive air and space operations and the proper balance of strategic, operational, and tactical applications of air and space power. Technically sophisticated air and space assets will be available only in finite numbers; thus, balance is a crucial determinant of success for an air commander.

Yom Kippur

An example of balancing the necessity of taking action against associated risk occurred during the October 1973 Yom Kippur War. Recall that after the initial Egyptian and Syrian successes, the Israeli Defense Forces held steady and by 10 October counterattacked – but without first achieving air superiority. This action proved to be

very costly. During the first week, the Israelis lost sixty fighter aircraft. This rate was twenty times larger than the factory production rate for the planes. The potential consequences of such high aircraft losses highlight the need for careful balancing of action taken and risk involved. Although the situation may sometimes force a violation of this tenet, commanders must strive to maintain a proper balance between risk and gain.

Summary
The characteristics of air and space power make it fundamentally different from land or sea power. Our doctrine has identified the seven tenets of air and space power as the fundamental truths for its proper employment. This lesson has presented an in-depth description of each tenet and historical examples of their application. It is the duty of all commanders to incorporate the tenets of air and space power into joint operations thus maximizing the effectiveness of not just air and space forces, but surface forces as well. Failure to frame the employment of air and space power within these tenets during a campaign or battle may result in less than optimum combat capability. Though this lesson has presented them individually, the tenets of air and space power are concepts which must be followed simultaneously. When employed separately they only partially contribute to mission effectiveness. It is only when the tenets are followed that air and space forces are able to provide their maximum contribution to attaining national objectives.

Distinctive Capabilities

Introduction
General Jumper, Chief of Staff of the Air Force, calls the distinctive capabilities significant because, together with our core values, they serve to define the essence of who we are as airmen and will guide our continuing development as an air and space force. Hence, the United States Air Force's fundamental service to the nation is its ability to develop, train, sustain, and integrate the elements of air and space power to execute those distinctive capabilities across the spectrum of conflict. The U.S. Air Force's distinctive capabilities are discussed in AFDD One. Understanding the distinctive capabilities will help you articulate the contributions of air and space power to the joint arena.

Lesson Objective
The objective of this lesson is for you to comprehend how the distinctive capabilities contribute to air and space power. To reach this objective, this lesson explores how each distinctive capability contributes to joint warfighting. It also summarizes the importance of each distinctive capability in air and space operations. Finally, the lesson examines how the distinctive capabilities enhance the application of air and space power.

Overview
This lesson will examine how the distinctive capabilities contribute to air and space power. To do that, the lesson will first present the concept of a distinctive capability. It will next give you an in-depth description of each of the capabilities while focusing on specifically what they provide to air and space power.

Distinctive Capabilities
The distinctive capabilities spring directly from the Air Force's core competencies. They are those vital areas of expertise the Air Force brings to any military operation or activity. Distinctive capabilities represent a combination of professional knowledge, air and space power expertise, and ~~technological~~ technical know-how that, when applied, produces superior military capability. Distinctive capabilities are at the heart of the Air Force's strategic perspective and thus, represent the Air Force's contribution to our nation's joint warfighting team. When combined, the distinctive capabilities produce a flexibility that is the foundation for the employment of air and space power. This flexibility allows the Air Force to rapidly concentrate anywhere and attack any target or set of targets. Distinctive capabilities are the basic areas of expertise that the Air Force brings to activities across the range of military operations, either as a single service or in conjunction with the distinctive capabilities of other services.

Air Force Distinctive Capabilities
The distinctive capabilities are not Air Force doctrine per se but instead, enable the fulfillment of doctrine. They, along with the core competencies, translate the central beliefs of doctrine into operational concepts. They also provide robust and flexible

options for the Joint Force Commander. The distinctive capabilities are: air and space superiority, precision engagement, information superiority, global attack, rapid global mobility, and agile combat support.

Air Force Distinctive Capabilities; Cont-

A particular distinctive capability is not necessarily unique to the Air Force. For example, all of the services perform some type of precision engagement, all engage in information warfare, and the U.S. Navy provides global mobility. What distinguishes the Air Force's distinctive capabilities from those of the other services are the speed and the global nature of its reach and perspective. In this context, the distinctive capabilities represent the embodiment of air and space power capabilities within a well-trained and well-equipped Air Force.

Air and Space Superiority

The first distinctive capability, air and space superiority, is the keystone capability for it is the first requirement of air and space forces. Control of the air and space environment enhances freedom of action, provides freedom to attack as well as freedom from attack, and allows joint forces to dominate enemy operations. Success in air, land, and sea operations depends upon air and space superiority.

Air and Space Superiority2

Air and space superiority is that degree of dominance which permits friendly land, sea, and air forces to operate at a given time and place without prohibitive interference by the opposing force. To gain control of the air, friendly forces must counter enemy air, missile, and air defense artillery threats to, not only, assure full force protection for surface forces, but also to enable full military flexibility to conduct parallel warfare across the theater of operations. Gaining control of space is also essential to any Joint Force Commander. It is vital in order to preserve the commander's ability to conduct Intelligence, Surveillance, and Reconnaissance missions, to command and control his forces, and to communicate and navigate.

EXAMPLE: Desert Storm

Since the earliest days of air and space operations, air and space superiority has been the decisive factor in winning virtually every campaign. For example, let's look at DESERT STORM. Through a coordinated and integrated air campaign, coalition forces achieved air and space superiority, even though Iraq still possessed much of its air force. Air and space superiority allowed all coalition forces to operate at will throughout Iraq. It was this effect of air and space power that led Iraq to surrender, rather than the total annihilation of the Iraqi force.

EXAMPLE: Bosnia

Air and space superiority was also an important factor in driving warring parties in the Balkan crisis to peace talks in 1995. During the conflict in Bosnia-Herzegovina, NATO forces achieved air and space superiority as a means of preserving freedom of action for peacekeeping and humanitarian relief efforts. This operation, called OPERATION DELIBERATE FORCE, also denied freedom of action to belligerent forces. However,

belligerent Serbs ignored an order by NATO to remove their heavy weapons from the Sarajevo safe areas. In response, NATO aircraft attacked Serb ammunition depots, heavy artillery, and command and control bunkers. By doing so, NATO peacekeeping forces denied the Serbs freedom of action, stopped their aggressive attacks, and drove them toward peace negotiations. These talks eventually led to the signing of the Dayton Peace Accords. In this case, air and space superiority was a driving and decisive factor in achieving peace.

Precision Engagement
The next distinctive capability, precision engagement, provides our Nation with the ability to use a precise application of military capability to meet policy objectives. It enables air power to deliver the desired effect, with minimal risk and minimal collateral damage. Precision engagement during DESERT STORM allowed the U.S. to attack command and control centers and key industries with limited collateral damage.

Precision Engagement2
Precision engagement enables U.S. Forces to locate a target, apply selective force, assess the level of success, provide responsive command and control, and retain the ability to re-engage when required. Precision engagement is what makes parallel attack decisively effective. For more information on parallel attack refer to AFDD One. Precision engagement also affords the ability to command, control, and employ forces to cause discriminate strategic, operational, or tactical effects.

Evolution of Precision Engagement
Years ago, early proponents of air power, such as Billy Mitchell and Giulio Douhet, saw the potential of air power; however, at that time, technology was unable to fulfill the vision of a dominant force in the air. As technology improved, precision capability increased and the probability of error decreased. There has been a dramatic change in precision bombing over the past 50 years. The ability to precisely hit a target to create a desired military effect, while minimizing civilian causalities, has made air and space power the "scalpel" of joint operations.

Examples of Precision Engagement
As technology has improved over the years, so has bombing accuracy. This increased accuracy has further reduced the expenditure of time and resources required to achieve a strategic effect.   During the Vietnam War, it took U.S. forces eleven years to destroy five bridges. During DESERT STORM, seventy-two bridges were destroyed in just six weeks. Coalition aircrews in the Gulf War significantly degraded Iraq's oil production, electricity, transportation, communications, and ability to produce weapons of mass destruction with a mere one percent of the bomb tonnage dropped during the entire Vietnam War. Since DESERT STORM, the Air Force has continued to improve its precision strike capability. Today, 100 percent of Air Force strike aircraft are precision capable.

Precision Engagement-Nonlethal Operations
In addition to the traditional application of lethal force, precision engagement includes the use of non-lethal operations as well. Some examples of non-lethal operations are: surveillance of peace agreements between belligerents by airborne and space-based assets, employment of Air Force Special Operations forces in small-scale but precise operations, and rapid airlift response to the source of erupting humanitarian disasters.

Information Superiority
The third distinctive capability, information superiority, is the ability to; collect, control, exploit, and defend information while denying an adversary the ability to do the same. It also includes gaining control over the information realm and fully exploiting military information functions. The capabilities offered by information superiority provide military commanders an integrated and interactive picture of the entire battlespace. Information superiority efforts include attempts to develop the ability to consistently react to a situation and make correct decisions more rapidly than the enemy.

Information Superiority2
Information superiority was the first function performed by airpower assets. In World War One, balloons were used as spotters for army commanders who wanted information about an adversary. Today, the Air Force is the major operator of sophisticated air and space-based intelligence, surveillance, and reconnaissance systems and is able to rapidly respond to the information they provide. For example, information superiority enabled the U.S. to make a timely response to the October 1994 Iraqi force build-up that threatened Kuwait, thus possibly preventing a second invasion of that country.

EXAMPLE: Deliberate Force
Information superiority likewise contributed significantly to convincing belligerents in Bosnia to negotiate and conclude the Dayton Accords. During OPERATION DELIBERATE FORCE, E-8 J-STARS, U-2 aircraft, unmanned aerial vehicles, and reconnaissance satellites monitored ground-to-ground operations. These platforms located and monitored the Serb's heavy weapons. With this information, NATO airpower enforced a U.N. safe area, which enabled them to protect U.N. forces and civilians, by targeting surface-to-surface threats in the declared "exclusion zones." NATO airpower stemmed enemy aggression and drove the warring parties to peace negotiations.

Global Attack
The fourth distinctive capability, global attack, represents the Air Force's ability to rapidly attack anywhere on the globe. Global attack enables the Air Force to rapidly provide tailored air and space capabilities, thereby initiating a powerful response to aggression or humanitarian need. All military services provide strike capabilities, but air and space power can attack rapidly and persistently with a wide range of munitions anywhere on the globe, at any time.

Global Attack2

The Air Force, with its growing space forces, intercontinental ballistic missiles, fleet of multi-role bombers, and attack aircraft supported by a large tanker fleet is ideally suited for conducting global attack. Our service is able to rapidly project power over global distances and maintain a virtually indefinite "presence" over an adversary. When combined with our inherently strategic perspective, Air Force operations can be the first and potentially <u>the</u> most decisive factor in demonstrating the Nation's will to counter an adversary's aggression.

Rapid Global Mobility

The fifth distinctive capability, rapid global mobility, enables the Air Force to provide timely and responsive support to the full range of contingencies and conflicts. Rapid global mobility refers to the timely movement, positioning, and sustainment of military forces and capabilities through air and space across the range of military operations. The ability to move rapidly to any spot on the globe allows the U.S. to react quickly and respond decisively to unexpected future challenges. Global mobility also enables air and space forces to assist joint forces and multinational efforts.

Rapid Global Mobility-Examples-

There are numerous examples of the worldwide effect of rapid global mobility. In theaters where minimal forces are forward deployed, the value of rapid global mobility is maximized, since the key to successful contingency operations is the capability of the U.S. to rapidly deploy forces to aid friendly nations. Although sealift forces also provide mobility and may provide more total lift capacity, air and space forces more rapidly provide what is needed.

EXAMPLE: Enduring Freedom-

The United States' ability to prosecute combat actions during Operation ENDURING FREEDOM depended on rapid global mobility. Due to the location of Afghanistan, airlift assets provided all of the logistical support in the early phases of the operation. This was an enormous undertaking and one of the first times that a combat operation of this size was solely supported by airlift forces. U.S. forces overseas have been significantly reduced in number since the Cold War, while rapid power projection has become an essential component of our military strategy. As a result, the distinctive capability of rapid global mobility has increased in importance to where it is now required in virtually every military operation.

Agile Combat Support-

Agile combat support allows combatant commanders to improve the responsiveness, deployability, and sustainability of their forces. Agile combat support substitutes responsiveness for massive deployed inventories. This reduces the mobility footprint, which frees lift assets and reduces force protection requirements. To realize the goals of agile combat support, the Air Force has vastly improved its information systems and adopted state-of-the-art business practices. The result is total asset visibility and time-definite delivery. A unit can order resupplies and be assured of their time and place of delivery by tracking them from factory to flightline. But agile combat support transcends

the traditional logistics arena by ensuring maintainability and supportability issues are addressed during weapon system design. Given that unit combat support can quickly exceed initial deployment requirements, it becomes apparent that how we sustain forces is at least as important as what forces we deploy.

Air and Space Power Functions
The air and space power functions represent the broad, fundamental, and continuing activities of air and space forces. The functions of air and space power reflect those the Air Force has been assigned by the Department of Defense and are not exclusive to the Air Force. It is these activities that the distinctive capabilities focus upon. Here is a list of those activities. Place your mouse cursor over a function to see a description of that function.

Summary
The Air Force's six distinctive capabilities provide our national leaders with tremendous flexibility, global situational awareness, and the ability to rapidly deploy decisive combat power to any spot on the globe. Air and space superiority, precision engagement, information superiority, global attack, rapid global mobility, and agile combat support are the capabilities that will shape the future force structure. It is imperative that airmen have a thorough knowledge and appreciation of the Air Force distinctive capabilities in order to maximize the full potential of air and space power in achieving national objectives.

Space and Information Operations

Introduction

Air Force doctrine tells us that air and space power is the synergistic application of three systems, air, space, and information. The overlap is such that it's often difficult to decide whether a particular operation should be categorized as air or space or information. Consider the employment of one our newer smart weapons, the Joint Direct Attack Munition or JDAM. The first step is to identify the target and determine its precise location. This is an intelligence, surveillance, and reconnaissance activity which is part of information operations but the data used will often be collected by space systems. The delivery aircraft uses precision navigation and positioning to arrive at its release point and initialize the bomb's guidance. This is also an information operation supported by space systems. The bomb itself uses Global Positioning Satellites, a space system, for its terminal guidance. Post-strike data will be collected by space systems and turned into information by ISR information operations. Thus, what might at first glance appear to be an airpower mission, is really the fusion of air, space, and information operations. This lesson takes a closer look at the role of space and information operations in providing air and space power.

Lesson Objective

The objective of this lesson is for you to comprehend the contributions of space and information operations in the application of military power. At the end of the lesson you should be able to explain the contributions of space power as applied in military operations. You should also be able to describe the concept of information operations as applied to global military activities.

Overview

The lesson begins by looking at information operations. Information operations include both information-in-warfare and information warfare. You'll get a feel for the types of activities that are included in each as well as the information services that enable them. The lesson will very briefly cover how the Air Force organizes to conduct information operations. The lesson will then take a similar look at space operations. We'll look at the four space missions, concentrating on the mission of space force enhancement. We'll look at the organization of Air Force space forces, again very briefly. The lesson will end by looking at how space and information operations fuse with air operations within an air operations center, or AOC.

Information Superiority

History is replete with examples showing a high correlation between information superiority and victory. The need for information has been recognized since man first gave warfare serious thought and today's Air Force has developed information superiority as one of its distinctive capabilities. Information superiority is "that degree of dominance in the information domain which allows friendly forces the ability to collect, control, exploit, and defend information without effective opposition." The Air Force conducts information operations, or IO, to achieve information superiority. IO are those

actions taken to gain, exploit, defend, or attack information and information systems and include both information-in-warfare and information warfare. Information-in-warfare, or IIW, provides commanders battlespace situational awareness across the spectrum of conflict. IIW functions involve the Air Force's extensive capabilities to provide awareness based on integrated intelligence, surveillance, and reconnaissance (ISR) assets; its information collection and dissemination activities; and its global navigation and positioning, weather, and communications capabilities. Information warfare, IW, involves operations conducted to defend one's own information and information systems, or to attack and affect an adversary's information and information systems. IW operations are conducted within the air and space power function of counterinformation. Counterinformation seeks to establish a desired degree of control in information functions that permits friendly forces to operate at a given time or place without prohibitive interference by the opposing force. Like the counterair function, counterinformation has a defensive and offensive component. Defensive counterinformation, or DCI, involves activities conducted to protect and defend friendly information and information systems. Offensive counterinformation, or **OCI**, involves activities conducted to control the information environment by denying, degrading, disrupting, destroying, and deceiving the adversary's information and information systems. IW and IIW are enabled and supported by information services. Information services provide the infrastructure, communications pathways, computing power, applications support, information management, and network operations to make what's called the global information grid a reality. The next few pages will take a closer look at how information operations support military operations.

Information in Warfare
Information-in-warfare makes sure that commanders, planners, and warfighters have the meaningful information they need to make decisions and to plan and execute operations. For an example of the importance of information-in-warfare, we can look back at DESERT STORM.
When Iraq invaded Kuwait on August 2, 1990, satellite systems were first on the scene—high in orbit over the region—providing multi-spectral imagery and environmental data. Once DESERT STORM began, space assets allowed warfighters to navigate in the featureless terrain of the Iraqi desert, enabled real-time, secure, voice communications, provided Scud missile launch detection, and many other functions.
The first air assets deployed to the theater included U.S. Airborne Warning and Control System aircraft, or AWACS, which monitored the skies over Iraq and provided information on the readiness and capabilities of the Iraqi air force. Over 100 additional surveillance and reconnaissance aircraft were deployed to the theater to collect information.
Air and space assets, such as these, enable the IIW functions of: intelligence, surveillance, and reconnaissance; precision navigation and positioning; and weather services. These functions, together with public affairs operations, provide critical support to air, space, and other information operations, by giving commanders, planners, and operators the ability to observe the overall battlespace.
More information about each of these IIW functions can be seen by placing your cursor over the function.

Offensive Counterinformation
You'll recall that information warfare is the attack and defend portion of IO versus IIW's gain and exploit functions. Offensive counterinformation is the attack part of IW. It includes activities where we use information as a weapon or attack the enemy's information systems or just the information contained within them. OCI controls the information realm by denying, degrading, disrupting, destroying, or deceiving the enemy's information or information systems through psychological operations or PSYOP, electronic warfare, military deception, physical attack, computer network attack, and public affairs operations. You can click each activity to learn more about it.

Defensive Counter Information
Since information plays such a large part in air and space power, we've come to increasingly depend upon it. This dependency breeds a certain vulnerability. Without information dominance, air and space power would be much less effective. To protect the information dominance that we've come to rely upon, we must defend our information and information systems. Not surprisingly, defensive counterinformation activities are, for the most part, the defensive reflection of OCI activities but also include the proactive security measures of OPSEC and information assurance. You can learn more about each of these by clicking on the links.

Information Services
Air Force information services (ISvs) provide the infrastructure, communications pathways, computing information services power, applications support, information management, and network operations to make the global information grid a reality. The global information grid, or GIG, is the globally interconnected, end-to-end set of information capabilities, associated processes, and personnel for collecting, processing, storing, disseminating, and managing information on demand to warfighters, policy makers, and support personnel supporting the DOD, intelligence community and other national security organizations. ISvs support the Air Force component of the GIG. The elements of the Air Force's ISvs include: information assurance; applications; spectrum management; information resources management; establishment, operation, and sustainment of networks; and information technology infrastructure. ISvs are a critical part of the Air Force's effort to achieve information superiority. For example, ISvs provide the underpinnings for reachback capabilities, tight sensor-to-shooter links and distributive collaborative planning tools. The result of optimized information services is confidence in the integrity and reliability of available information—a prerequisite for information superiority. More information about each element of ISvs can be seen by placing your cursor over it.

Air Force IO Organizations
Let's take a brief look at how the Air Force organizes itself to conduct IO. At the Service level is the Air Intelligence Agency, or AIA. AIA is the single agency for the performance of Air Force wide intelligence roles and functions. AIA provides full-spectrum IO support through reachback to Air Force major commands, Air Force components, and national decision-makers. A major organization within AIA is the Air Force Information Warfare

Center, or AFIWC. AFIWC's mission is to develop, maintain and deploy information warfare capabilities in support of operations, campaign planning, acquisition, and testing. AFIWC has organized itself into many units to perform its mission including the Air Force Information Warfare Battlelab. The purpose of the Air Force battlelabs is to identify off-the-shelf technology that could provide new military capabilities and demonstrate those capabilities for possible adoption by the war-fighting organizations. AFIWC also owns the Air Force's IW schoolhouse. The 39th Information Operations Squadron at Hurlburt conducts the formal training for all of the Air Force's IW warriors. You may review the pop-up information for these organizations by placing your cursor over its shield.

NAF Level IO organization

The numbered air force, or NAF, is the senior war-fighting echelon in the Air Force. The 8th AF is the lead NAF for conducting Air Force IO. Its 70th Intelligence Wing collects, analyzes and reports current information needed to support IO. The 67th Information Operations Wing is responsible for executing information operations missions. Of particular note, the 67th IOW operates the Air Force Computer Emergency Response Team or AFCERT. You'll remember the AFCERT along with the Air Force network operations center are the Air Force level organizations charged with providing network ISvs. Other NAFs have IO assets. In particular, they field several IW flights. The IW flight is the most fundamental Air Force IW unit and we'll look at it next.

IW Flights

IW flights are deployable units that can provide full OCI and DCI planning capability for a NAF-level combat entity. Nine IW flights are currently assigned to the NAF and MAJCOM headquarters shown on the screen. The 26-29 personnel of the IW flight have expertise covering the full gamut of information operations. During peacetime, they would provide support to the deliberate planning process as well as the training function. During contingencies, an IW flight can deploy and operate out of the air operations center in support of the Commander of Air Force Forces who would often be dual-hatted as the JFACC. Their expertise would be used to integrate IO operations into the air campaign. The IW flight would also send representatives to the joint IO cell to ensure Air Force assets are properly utilized within theater-level IO operations.

Space Operations

The military, civil, and commercial uses of space have mushroomed since the first satellites were orbited. Indeed, the proliferation of space technology provides commonplace access to militarily significant capabilities. While this proliferation is worrisome, the dependence of the US military, civil and commercial sectors on space-based capabilities is a potential vulnerability. The military use of space is a significant force multiplier when integrated into joint operations and a critical enabler of many warfare areas. Our look at information operations has given us a glimpse of the importance of space operations – let's take a closer look.

Space Characterixtics
As Gen Lyles noted on the last screen, space is the ultimate high ground. Satellites occupy this high ground and can be placed in different types of orbits around the earth. With their line-of-sight access to large areas, satellites provide commanders useful combat capabilities such as communications or intelligence, surveillance and reconnaissance.   Space's status as international territory allows satellites unlimited access and overflight of areas inaccessible by terrestrial systems. Barring adversary intervention, satellites offer long mission lives with little sustainment required.

Orbit Characteristics
Satellites are placed into orbit at different distances from the earth, depending upon the satellite's mission. For example, to obtain detailed weather information, mapping or imaging data, satellites are placed in low earth orbit. These low earth orbit satellites have a limited view of the earth, but produce high resolution data. Low earth orbits are of short duration and will often allow a satellite to visit a particular area more than once a day.
Satellites that provide communication or navigation data are often placed in semi-synchronous or medium earth orbit. One of the specialized orbits in this category is the highly elliptical orbit used by the Molniya satellite. This orbit gives the satellite extended dwell or viewing time over a target hemisphere that can approach 20 hours per day. Missions such as wide-area reconnaissance, communications and global weather mapping, are performed by satellites in earth orbits beyond 11,000 nautical miles. The geosynchronous orbit at 22,500 nautical miles along the equatorial plane is a particularly useful high earth orbit. A satellite in a special geosynchronous orbit called a geostationary orbit follows the rotation of the earth and remains constantly above the same point of the earth.

Space Missions
JtPub 3-14 breaks out military space operations into four mission areas: space control; space force enhancement; space support; and space force application. Space control involves operations by land, sea, air, space and/or special operations forces by which space superiority is gained and maintained to assure friendly forces can use the space environment while denying its use to the enemy. To accomplish this space forces must surveil space, protect our ability to use space, prevent adversaries from exploiting US or allied space services, and negate the ability of adversaries to exploit their space forces. Space support consists of operations to deploy, augment, sustain and replenish space forces. This includes the configuration of command and control structures for space operations. Support operations include space lift; satellite operations such as telemetry, tracking and commanding; and the de-orbiting and recovery of space vehicles, when required. Space force application consists of attacks against terrestrial-based targets carried out by military weapon systems operating in or through space. Currently, there are no force application assets operating in space but intercontinental ballistic missiles operate through space and their use would be considered a space force application. Space capabilities, however, fill a crucial role in other force applications like JDAM employment. As such, space capabilities can be considered an indispensable element of any force application. Space force enhancement involves direct support to the

warfighter and we'll look at it in greater detail. Information about the other missions can be reviewed by moving your cursor over it them.

Space Force Enhancement

Space force enhancement operations is another way of saying "direct space support" to the warfighter. These five key support functions multiply the effectiveness of joint forces: precision navigation; space-based weather; ballistic missile warning; communications; and environmental sensing & intelligence. Each of the functions is linked to additional information.

Air Force Space Organization

Space Air Force is the Air Force service component of the combatant command, USSTRATCOM. Space Air Force performs the Air Force's warfighting space operations within the operational branch of the chain of command. These operations include space lift, on-orbit satellite control, global ballistic missile warning, and space control operations. Within the administrative branch of the chain of command, 14th Air Force falls under the MAJCOM, Air Force Space Command. Fourteenth Air Force is responsible for the organize, train, and equip functions in support of Air Force space operations. In actuality, the Space Air Forces Commander and 14th Air Force Commander are the same person and both organizations are matrixed together. Fourteenth Air Force has a number of subordinate units which execute space missions under the authority of Space Air Force. You may roll your cursor over a unit to see more information about its operations.

SPACEAF AOC

Space Air Force operates an Aerospace Operations Center at Vandenberg AFB. Its Strategy, Combat Plans, Combat Ops, and ISR divisions support the planning and execution of space operations. The strategy division supports development of strategic plans during deliberate planning and ops assessments during crises. Combat plans supports the development of the Master Aerospace Attack Plan as well as the daily Space Tasking Order. Combat Ops executes the STO, while the intelligence, surveillance, and reconnaissance division supports planning and execution. Specialty teams provide the divisions functional expertise as required. The organization of the aerospace operations center reflects that found in a theater air operations center. This makes reachback from the theater AOC divisions to the SPACEAF AOC relatively easy. As we'll see, the Aerospace Operations Center is a valuable asset to theater warfighters.

Theater Space Support

Many operations plans and operations orders designate that USSTRATCOM will support a theater commander. USSTRATCOM exercises command and control of the space service components through its Space Operations Center. The usual support agreement establishes direct liaison authorized, DIRLAUTH, between the space service components and the elements of the supported commander's joint force. Under DIRLAUTH, all **taskings** must still flow through the formal chains of command. For the Air Force, the preferred interaction is with the JFACC through the Joint Air Operations

Center. Manning for a baseline air operations center includes space support specialists trained to interact with their counterparts in the SPACEAF Aerospace Operations Center. In the event a JFACC is not designated, SPACEAF would liaison with the joint force commander's operations staff.

AOC Space and Info Operations
Within a joint force, there will always be a Commander of Air Force Forces or COMAFFOR designated. He will establish an air operations center or AOC to help him perform his responsibilities. The AOC may become a JAOC if the COMAFFOR is designated the JFACC. The baseline AOC has five divisions, four of which mirror those in SPACEAF's aerospace operations center, plus an air mobility division. There are various functions that the AOC performs that actually cut across the 5 divisions, two of which are space and information operations. In the case of IO, we saw earlier that an IW Flight will deploy into an air operations center. It's 26-29 people will actually man positions across the AOC's five divisions. It's their job to ensure that information operations are properly integrated or coordinated with their divisions' functions. In the case of space support, the core AOC team has members in each division who are trained in space support issues. They rely heavily on their counterparts in the SPACEAF AOC for the space support needed by theater operations.

Summary
We hope this lesson has convinced you that air and space power isn't just about airpower. Sure, airplanes put bombs on target, but knowing what to target, knowing where the target is, and being able to get there precisely involves space and information operations. Information operations are structured to gain and exploit information through information-in-warfare activities; defend our systems from attack and exploitation through defensive counterinformation; and to attack our adversary's information and systems through offensive counterinformation. All of these activities rely upon an information infrastructure provided by information services. Many of the services provided by information ops rely upon the ultimate high ground – space. We looked at space missions, especially that of space force enhancement. Given the critical importance of information and space operations to air and space power, both have been integrated into the air operations center. Modern air and space power truly is a synergy of air, space, and information.

Army, Navy, USMC Doctrine

Introduction

Each service has endorsed and supports the concepts of joint service operations. Each service also has its own traditions, beliefs, and biases regarding the employment of air and space power. Consequently, each service, while supporting and contributing to joint air operations, still maintains a distinct, independent service perspective on air and space power issues. Each service has its own perspective on doctrinal issues that it considers inviolate. To intelligently articulate Air Force doctrine to members of other services, Air Force members must know and understand the evolution of doctrine in other services. An understanding of the doctrinal issues, perspectives, and supporting rationale of these services will help Airmen understand how and why other branches employ air power as they do. This understanding will enhance operationally effective joint service air and space power employment.

Lesson Objective

This lesson will explore the air and space power employment perspectives of the Army, Navy, and Marine Corps. In achieving this objective, you'll be able to describe the role of air and space power in Army operations. You'll be able to summarize the Navy's employment of air and space power in maritime operations. Finally, you'll be able to explain how the Marines employ air and space power in a Marine Air Ground Task Force, or MAGTAF.

Overview

Although the Army, Navy, and Marines were established at about the same time, all have been affected by different influences and have followed divergent paths to their current doctrinal beliefs. For each of the three services we'll look at the service's purpose, history, its doctrinal evolution and its perspective on the use of air and space power. We will begin with The Army.

The Army-Purpose

The Army's non-negotiable contract with America is to fight and win the nation's wars. Army operations rely heavily on established doctrine. To that end, Army doctrine touches all aspects of the Army – from training to the conduct operations across the spectrum of conflict. The fundamental purpose of the Army is to serve the Nation by protecting our enduring national interests and by fulfilling the Army's national military responsibility. That responsibility, delineated in Title 10 of the United States Code, is to organize, equip, and train forces for the conduct of prompt and sustained combat operations on land.

Early Army Aviation
The Army's experience with airpower began when it used balloons as spotters for directing artillery fire in the mid 1800's. It's little surprise then that the first Wright flyer, accepted in 1909, was assigned to the Signal Corps, a combat support arm. Many Army officers felt the primary purpose of air forces was to support the ground operation. Airpower advocates demonstrated the offensive capabilities of airpower and pressed for increased autonomy for air operations. The drive for autonomy was bolstered by the establishment of the Army Air Forces just prior to World War II and the offensive surprises of Pearl Harbor and the Luftwaffe successes in Blitzkrieg. As a compromise, Organic Army Aviation was created in June 1942 under direct control of the ground commanders. With the creation of the Air Force and its focus on developing a nuclear doctrine for the Cold War, Army ground commanders expanded the missions of organic air.

Aviation Doctrine Evolves
When the US Air Force was created on 18 September 1947, the Army's Organic Air Arm further expanded to fill the aviation support requirements of ground forces. In the Korean War, an expanded use of helicopters in support roles began a reliance on organic helicopters that reached maturity in Vietnam. This employment of the Army's helicopters, especially in the close battle, drove a doctrinal expansion of the traditional view of the static battlefield. This shift in Army thinking aggravated differences between the Army and Air Force over the control of aviation assets. Throughout the Cold War, Army and Air Force battle plans centered on the Soviet threat in the European Theater. In addressing this threat "AirLand Battle" doctrine was presented in the 1982 Field Manual 100-5 and temporarily clarified the roles of the Army and Air Force during joint operations. AirLand Battle doctrine re-defined the traditional battlefield with a series of geographic and linear references that survive today. AirLand doctrine integrated concepts of conventional, nuclear, chemical, and electronic warfare, and emphasized simultaneous, synchronized early and decisive offensive operations in the air and on land. While Air Force assets were designated specifically for prosecution of strategic targets, deep operations and for shaping the battlefield, Army battle plans relied to a large extent on Air Force assets for close air support employment as "fires" or flying artillery.

Operations in the Battlespace
Before trying to understand the Army's current perspective on air and space power, it's important to understand how the Army views their own operations and the battlespace within which they operate. The battlespace is a conceptual construct that allows commanders to visualize the factors that impact an operation. Some portions of it are not definable in geographic terms. For instance, the information environment includes space-based sensors as well as civil considerations. The area of interest contains all areas that could impact the operation. Enemy occupied areas outside the Area of Operations, or AO, and supply lines would exist in the area of interest. The area of influence is the geographic area a commander can directly influence by maneuver or fire support systems. The area of operations is the geographic area within which the commander is authorized to conduct operations. At any given time, the area of

operations may be greater than or less than the area of influence. Within the overall AO, subordinate units are assigned their own particular AOs. Shown here is the case where the senior Army echelon is a corps and its AO is divided up among its subordinate divisions. Sometimes the subordinate AOs are not contiguous. This lends itself to the concept of non-linear operations where maneuver units may operate throughout the AO and focus on separate objectives and multiple decisive points without reference to adjacent forces. These operations are becoming more common and the Army's transition to smaller, lighter, more mobile and more lethal forces indicates that nonlinear operations will become more and more common. Information about the various parts of the battlespace can be reviewed by placing your cursor over it in the diagram.

Types of Operations
The Army achieves full spectrum dominance by balancing 4 types of operations: offensive, defensive, stability, and support. The relative mix of operations varies across the spectrum of conflict. For instance, offensive operations dominate during war but might not occur at all during peace operations. You probably understand offensive and defensive operations. During periods of peacetime military engagement and other operations other than war, two other types of operations dominate and may be decisive. Stability operations promote and protect U.S. national interests through a combination of peacetime developmental, cooperative activities and coercive actions in response to crises. Support operations employ Army forces to assist civil authorities, foreign or domestic, as they prepare for or respond to crisis and relieve suffering. You can review the pop-up information by rolling your cursor over it in the diagram.

Operations in the AO
Within the AO, the Army organizes its forces in terms of function and space. Functionally, forces are allocated to three categories of operations: decisive, shaping, and sustaining. In the case of linear operations like traditional maneuver combat, the commander will often describe operations in spatial terms: rear, close, and deep. Close operations occur in contact with the enemy. Generally, a commander will plan to conduct the decisive operation within the close area. The deep area is an area forward of the close area that commanders use to shape enemy forces. Shaping operations are conducted throughout the AO, not just in the deep area. They create and preserve conditions for the success of the decisive operation and may occur before, concurrently with, or after the start of the decisive operation. Shaping operations in the deep area may involve forces in close combat. The rear area is provided primarily for the performance of support functions and is where the majority of the echelon's sustaining operations occur. Operations in rear areas assure freedom of action and continuity of operations, sustainment, and command and control. The diagram depicts traditional linear operations where forces move together against an enemy in concert with adjacent units. As you can see, the Army likes to put lines on their maps. We'll add a couple more for good measure.

Control Measures

The forward line of own troops, or FLOT, is easily understood – it's the line drawn between us and them. The forward edge of the battle area or FEBA is the front line of the battle. Scouts and other screening forces usually decline engagements so the FLOT is usually ahead of the FEBA. Another very important line is the fire support coordination line or FSCL. It's a fire support coordinating measure, established and adjusted by land or amphibious force commanders within their AOs in consultation with superior, subordinate, supporting, and affected commanders. Short of the FSCL, all fires are controlled by the appropriate land or amphibious force commander. The purpose of the FSCL is to facilitate the expeditious attack of surface targets of opportunity beyond it. Forces attacking targets beyond the FSCL must inform all affected commanders in sufficient time to allow necessary reaction to avoid fratricide. The prevention of fratricide is a primary purpose of all of those lines the Army uses. Ground commanders have been known to halt operations when subordinate units didn't stay inside of their lines. A crossing-of-lines is one of the most perilous maneuvers a ground force undertakes and is never done without considerable planning. It's not surprising then that ground commanders demand air operations abide by certain lines. While the placement of the FSCL is often a contentious issue, it is a deadly serious one. It cannot be overemphasized that within his AO, a land component commander is a supported commander. He is responsible for supporting the joint force commander's objectives within the AO and has considerable latitude for deciding exactly how to do that.

Airpower Army Perspective

With an understanding of how the Army has historically viewed its operations within the battlespace, we can look at their perspectives on the use of airpower. These words of Fehrenbach are the very first ones on page 1 of chapter 1 of Field Manual 1and also appear on page 1 of FM 3-0, Operations. They summarize the Army perspective quite nicely. In addition, Field Manual 3-0 makes it clear the decisive operation will be accomplished by ground forces. To be fair, the Army is the first to admit that air and space forces are very important. Field Manual 3-0 presents the elements of combat power, and points out that air and space power makes major contributions to all of them. Air superiority provides protection and through freedom of action supports maneuver to conduct decisive operations. Air forces provide firepower in the form of close air support and air interdiction. Airlift support at the strategic, operational and tactical levels support maneuver. Finally, air and space forces provide critical information which enables situational awareness for its leadership. To sum up, air and space power is viewed as a tool that enables combat power, but like all tools, should be controlled by the AO commander to achieve success in the decisive ground operation.

Army Summary
Army doctrine is based on the belief that the contribution of land forces to joint warfighting is their power to control the land, its resources, and the people who live on it. This primacy of ground operations has influenced the Army's perspective on airpower since the Wright Flyer. All combat forces, whether armor, artillery, organic aviation, or other service forces are but tools at the disposal of the ground commander in pursuit of the decisive ground operation. While the Army fully endorses joint warfighting doctrine, and concepts like nonlinear operations indicate some flexibility of thinking about what a decisive operation is, the Army's doctrine is clear that all operations must support "boots on the ground."

Navy Purpose
The Navy's Title 10 purpose is to prepare for and conduct combat operations at sea. Naval forces are trained to arrive first on the scene, take control of a situation, then fight and win. The Navy has articulated its vision for achieving its purpose in the *From the Sea…* and *Forward…From the Sea* series of publications. Although employed extensively in traditional deterrence roles and in military operations other than war, the Navy's primary mission is warfighting, accomplished through battlespace dominance and power projection. Air and space forces are an integral part of all of these critical operational capabilities.

Early Navy Aviation
As Alfred Thayer Mahan campaigned for an expanded Navy in the early 1900's, the first Navy pilots were being trained. From this beginning, Naval forces and naval aviation expanded through WWI and the interwar years. While naval aircraft flew some offensive operations, they were primarily viewed as defensive weapons until the Japanese attack at Pearl Harbor. With the battleship fleet crippled, the missions of naval aircraft expanded to include fleet defense, close air support for ground operations, and power projection. Naval airpower played a major role in stopping the Japanese advance. By the end of World War II, naval airpower was accepted and respected as a formidable combat force. In both Korea and Vietnam, carrier aviation played critical roles. National security strategy after WWII centered around containment of the Communist expansion and naval doctrine stressed deterrence by nuclear-powered ballistic missile submarine operations and carrier forces. In the 1970's, the Navy formally articulated four Navy missions - strategic deterrence, sea control, power projection, and peacetime deterrence-all of which are dependent on naval air and space forces. Having demonstrated the potential of maritime air, the Navy began to employ the operational concept of forward presence with aircraft carriers serving as the centerpiece of Navy Battle Groups and amphibious ready groups.

Evolution of the Navy Mission
In the late 19th century, Adm Mahan modernized the US Navy and stressed a study of naval doctrine. He formalized the naval missions of forward presence, sea control and power projection. These concepts transformed from being battleship centered to carrier centered by the end of World War II. The Cold War emphasized nuclear deterrence and limited war options. This propelled the development of the ballistic missile

submarine force as well as solidifying the carrier as the centerpiece of the battlegroup. In 1992, *…From the Sea* called for a shift from the Cold War, open ocean, blue water naval strategy to a regional, littoral, and expeditionary focus. It called for naval expeditionary forces that would operate forward from the sea to project their power over land as part of a joint force. *…From the Sea* acknowledged the Navy's traditional operational capabilities of forward deployment, crisis response, strategic deterrence, and sealift, but added four more: Command, Control, and Surveillance; Battlespace Dominance; Power Projection; and Force Sustainment. In 1994, "Forward -- From the Sea" refined *…From the Sea's* direction and emphasized the importance of naval forces across the spectrum of military operations. In 1997, the Chief of Naval Operations Admiral Jay Johnson published *Forward…From the Sea, The Navy Operational Concept.* The essence of the Navy's "operational concept" is that Naval forces will continue to influence, directly and decisively, events ashore from the sea -- anytime, anywhere. Today, *Sea Power 21* establishes four fundamental groupings of naval capabilities. Sea Strike is projecting precise and persistent offensive power; Sea Shield projects global defensive assurance; and Sea Basing projects joint operational independence. These concepts are enabled by an advanced C4I architecture called Force Net.

Evolution of Naval Doctrine
Since its inception, the Navy has exhibited a distrust of formal written doctrine. Heavily influenced by the likes of Admiral Lord Nelson, the Navy has always relied upon strong individual leaders to use flexibility and initiative to accomplish clearly stated objectives. For years, doctrine consisted primarily of tactical publications. With passage of the Goldwater-Nichols Act in 1986, the end of the Cold War, and the adoption of joint operations as the nation's overarching military doctrine, the Navy saw the need to publish formal capstone doctrine. The Navy vision as presented in the *From the Sea* series of publications was a beginning. In 1994, the Navy began publishing a series of six capstone Navy Doctrine Publications, or NDP's. The documents were intended to ensure consistency between naval and joint doctrine and to provide standardization for naval operations. It's notable that NDP-3, *Naval Operation*s, the naval equivalent of AFDD2 or Field Manual 3-0 has yet to be published. For more information on the series, see Naval Doctrine Publication 1, *Naval Warfar*e.

Naval Warfighting
Warfighting is universally recognized as the Navy's primary mission and is composed of two primary operations: battlespace dominance and power projection. Naval airpower, whether carrier based, ship based, or land based is integral to both operations. A third critical operational capability, command, control, and surveillance largely enables battlespace dominance and power projection. A fourth capability, force sustainment gives naval forces endurance and staying power independent of local support. Air and space forces are an integral part of all of these capabilities.

Battlespace Dominance
Battlespace dominance is defined as the control of specific air and sea regions from which the Navy can project power. Battlespace dominance means establishing and

maintaining a zone of superiority that moves with the force. This includes superiority in the air, at sea, on land, under the sea, in space, and in the electromagnetic spectrum. Normally, battlespace dominance ensures a controlled environment before projecting power ashore, but operations can be concurrent and complementary. Battlespace dominance involves the following primary tasks; air warfare, surface warfare, undersea warfare, mine warfare, and information warfare. You may roll your cursor over each primary task to learn more about it.

Power Projection
Power projection is the attack of targets ashore, amphibious assault operations, and the sea control operations to support them. Power projection extends the range of battlespace dominance over enemy territory. Some of the primary tasks of power projection are strike warfare, attacks and raids, amphibious warfare, maritime prepositioning forces movement, and Naval special warfare. Roll your cursor over each task to learn more about it.

The Expeditionary Navy
Naval forces are expeditionary by nature. The primary expeditionary units of the Navy are the carrier battle group and the amphibious ready group. When crisis erupts anywhere in the world, the first question usually asked is, "Where are the carriers?" The second question is usually, "Where are the Marines?" But expeditionary forces need more than carriers and ARGs. Underway Replenishment Groups provide key logistics support to both the CVBGs and ARGs. In addition to national systems, the eyes and ears of the expeditionary forces are the Maritime Patrol and Reconnaissance aircraft. When the situation requires it, the Maritime Prepositioning ships begin to move. If mining is involved, Navy mine warfare assets will move into place. Other forces may also be called upon for uniquely naval missions such as escort duty and other sea control actions. Let's look at the capabilities and composition of some of these units.

Carrier Battlegroup
The exact make-up of a carrier battle group varies, but its mission remains constant – to gain and maintain battlespace dominance so it can project power. While most ships today are multi-mission platforms, their primary missions follow: The carrier, through its air wing, is the primary power projector by conducting strike warfare. The embarked air wing maintains considerable anti-air, anti-surface, and anti-submarine capabilities as well. It's really only the lack of worthy opponents that has diminished the carrier's mission of fleet defense though certainly not its importance. Guided missile cruisers are concerned with anti-air warfare and have a growing capability for theater ballistic missile defense that extends throughout the battlespace. Friendly forces ashore benefit from the air defense umbrella provided by the battle group and is yet another facet of power projection. Cruisers also have anti-submarine and anti-surface capabilities and their Tomahawk weapon systems provide strike options. Destroyers and frigates are generally used to screen the carrier from surface and undersea threats, however they also share in the anti-air warfare role, strike missions, and maritime blockade and inspection. Attack submarines protect the carrier against surface and undersea threats, and also provide national intelligence and tactical intelligence to the battlegroup.

Submarines also provide strike capabilities with their Tomahawk missiles. Logistics ships, like the Fast Combat Support Ship, keep the battle group topped off with fuel, ammo, parts, and food. Further information about the various ships can be seen by clicking on the ship type abbreviations.

The Amphibious Ready Group
The amphibious ready group is where you will find the Marines and, like the carriers, there never seems to be enough of them. There is usually an ARG forward deployed with each of the operational fleet commanders. The typical ARG has one large deck amphibious assault ship, an amphibious transport dock, and a dock landing ship. The large deck amphibious assault ship has room for 40+ helicopters that can carry over 800 Marines at 150 mph to do what's called a vertical assault. All of these ships have well decks that can launch various landing craft or amphibious assault vehicles. The most impressive of these is the landing craft air cushioned, that has an over the beach capability and a speed of 40kts. It can reach more than 70 percent of the world's coastline, while conventional landing craft can land at only 15 percent of the world's beaches. The ARG represents a mobile, flexible projection of power that operates independently -- in benign environments. The ARG is vulnerable to air, surface, and undersea threats as well as mines. It also has no dedicated naval surface fire support, and it's slow. With normal transit speeds of 12-15kts, it cannot keep up with a carrier battle group. These limitations will often require careful coordination with other forces to unleash the ARG's awesome capabilities. Links are provided to additional information on the various ARG platforms.

Navy Perspective on Airpower
Airpower is a key element of both of the Navy's warfighting critical operational capabilities --battlespace dominance and power projection. For the Navy, job one in establishing battlespace dominance is fleet defense, and air assets are essential to the anti-air, anti-surface, and undersea warfare components of fleet defense. Air superiority is a part of battlespace dominance that is maintained by shipboard air defense systems and carrier aircraft. The Navy's concept of power projection is direct and decisive influence of events ashore from the sea. Airpower, whether in the form of strike aircraft or Tomahawk Land Attack Missiles, is often the primary tool for projecting power ashore. If a ground campaign is not anticipated, the air campaign may actually be the decisive operation and may be led by a Naval commander. Another method of power projection ashore is through amphibious operations. Without adequate naval surface fire support, Navy air may be tied to support of the amphibious operation. Air assets then become part of the Marine combined arms team and their power projection contribution to the theater air campaign may be reduced. In the final analysis then, the Navy uses airpower to satisfy its own organic needs such as fleet defense and amphibious assault support, before making assets available to the theater air campaign. In this regard they are like the Army and Marine Corps, viewing airpower as an arm of a combined arms team. On the other hand, the Navy's current vision recognizes airpower as a form of power projection that can be decisive in achieving objectives. This view has sparked an aggressive upgrade of the Navy's airpower capabilities to increase the amount available to the Joint Force Commander.

Navy Summary
This lesson has traced the role of airpower in the evolution of the Navy's mission and related doctrine. Shaped by its history, the Navy has often held written guidance suspect, but learned well its main missions of sea control and power projection. With the advent of aircraft and traumatic events like Pearl Harbor, the Navy has made airpower an integral part of both its offensive and defensive operations within its warfighting critical operational capabilities of battlespace dominance and power projection. With the end of the Cold War, the Navy committed itself to the joint team with the recognition that many joint objectives lie ashore. The components of Sea Power 21: Sea Strike; Sea Shield; Sea Basing; and the C4I capabilities of Force Net all capitalize on air and space forces to enhance the Navy's contribution to the joint force.

USMC Introduction
From the halls of Montezuma to the shores of Tripoli, the Marine Corps has a rich tradition of service to the nation. The drawdown of forces following World War Two left the nation ill-prepared to meet the challenges of limited wars like Korea. In 1952, Congress acted to make sure the nation had an expeditionary force in readiness, ready when the nation generally is least ready. It set the force structure of the Marine Corps to be no less than 3 divisions. Always being ready, ready to go anywhere at any time, is part of what makes a Marine, a Marine. The Marine ethos is reinforced by doctrine and training. All Marines are trained as riflemen. Every Marine, regardless of rank or specialty, qualifies with the rifle every year. This training instills the essence of what a Marine warrior does and why he exists. A Marine F-18 pilot never forgets he is first a rifleman. Marine doctrine is presented as a way of thinking that unites all Marines within the Corps. To understand the Marine perspective on the use of airpower, you'll need to understand their doctrine… their way of thinking.

Early Marine Aviation
Marine Corps aviation began in 1912, when Marine Corps Lt. A. A. Cunningham began flight training at Annapolis. He returned to duty with the Advanced Base Force, a recently formed cadre of expeditionary and amphibious warfare specialists, and created an aviation section. During WW I, Marine Corps pilots and planes flew anti-submarine warfare missions, bombing raids against German targets, and air combat against German fighter aircraft. Between the world wars, Marine pilots trained with the Navy on aircraft carriers and with the Army at the Air Corps Tactical School. The primary role of aviation during that time was aerial support of ground forces such as the Marine Advanced Base Forces. Marines had the opportunity to take advantage of expeditionary flying in support of their ground forces during operations in Haiti, the Dominican Republic, Guam, China, and Nicaragua. These early experiences in supporting ground troops engaged in combat were instrumental in making the Marine air-ground team a reality. Doctrine for airpower in amphibious operations was developed, practiced, and published in 1934. The text proclaimed that the "first priority is to gain air superiority over the objective and fleet operating areas. Then, under the fighters' protection, other aircraft could reconnoiter, scout, direct naval gunfire, bomb and strafe shore targets, especially enemy defenses". Attack aircraft would be used in close proximity to

attacking infantry and against targets that naval guns and artillery could not hit. When WW II began, close air support to troops in contact was a new concept to all three services. However, Marines quickly gained a great respect and appreciation for airpower when they were left without air support for ten days during the Battle for Guadalcanal. Throughout the war, the necessity for air superiority and the value of aviation forces in close air support and interdiction roles were validated again and again.

Marine Aviation Evolves

After the Korean War, Congress mandated that the Marines would be "A balanced force for a naval campaign and a ground and air striking force…", "Always at a high state of readiness", "...To be most ready when the Nation generally is least ready". This was part of the same legislation that set their force structure to a minimum of 3 divisions. In answer to that mandate, Marine aviation evolved to become a completely expeditionary air arm. Marine Corps doctrine requires that aviation be rapidly established ashore and be prepared to operate from primitive airfields within the objective area. This expeditionary aspect sets Marine Corps aviation apart from all other aviation organizations. The bond between ground and aviation forces continued to strengthen and evolved into what is now called the Marine Air Ground Task Force or MAGTF.

The MAGTF

The Marines have developed the Marine Air Ground Task Force or MAGTF to implement their doctrine of combined arms maneuver warfare. The MAGTF is scalable in size but retains its basic organization. The command element includes the commander as well as the usual staff functions of administration, intelligence, operations, logistics and communications. The ground combat element has the ground forces including infantry, artillery, mechanized and amphibious. The air combat element includes helicopters in both attack and assault support roles, fighters for air defense, deep air support and close air support, as well as support aircraft for refueling, reconnaissance and electronic warfare. The combat service support element provides combat logistics and supply, medical, and maintenance support. The important thing to note is that all of these elements are under a single commander. You can review the pop-ups by placing your cursor over a block in the org chart.

Scalable MAGTF

MAGTFs range in size from the Marine Expeditionary Unit, or MEU, to the Marine Expeditionary Force, called a MEF. Most MEUs can conduct special operations type missions and these are called MEUSOCs. MAGTFs are tailored for their mission. Occasionally one is formed for a special mission and is appropriately called a Special Purpose MAGTF. While it can be any size it tends to be smaller than a MEU and generally performs disaster relief and humanitarian assistance missions. The MAGTF mission ranges from promoting peace and stability to participation in major theater war, thus covering the full spectrum of conflict. It is the MEU that forward-deploys on the Navy's 3 to 4 ship Amphibious Ready Groups or ARGs. A MEU can act as the advance echelon of a Marine Expeditionary Brigade, or MEB, should a crisis develop into a

smaller scale contingency. Likewise the MEB acts as the advance echelon of a MEF should major theater war erupt.

Marine Doctrine

Marines use the MAGTF to fight using a doctrine of combined arms maneuver warfare. Doctrine is usually considered a treatise on the best way of doing something or a philosophy of turning strategies into actions. For Marines it is much more. It's part of their ethos – that which makes them Marines. It is a way of thinking. As such, it is the basis for harmonious actions and mutual understanding. Marine Corps Doctrine Publication 1, *Warfighting*, is their capstone doctrine. Arranged in four chapters, the first deals with the complex and unpredictable nature of war. Chapter 2 points out that war is primarily an act of policy and the means of war are necessarily shaped by that policy. The last two chapters cover preparing for and conducting war. It's the last chapter that explains the concepts of maneuver warfare and combined arms used by the Marines.

Maneuver Warfare

Styles in warfare can be described by their place on a spectrum of attrition and maneuver. Warfare by attrition pursues victory through the cumulative destruction of the enemy's material assets by superior firepower. An enemy is seen as a collection of targets to be engaged and destroyed systematically and enemy concentrations are sought out as the most worthwhile targets. The focus is on the efficient application of fires leading to a highly procedural approach to war that tends toward centralized control. Attrition warfare recognizes the importance of maneuver, but only so far as to bring fires more efficiently to bear on the enemy. Metrics like body counts and terrain captured measure the progress of battle. On the opposite end of the spectrum is maneuver warfare. Maneuver warfare is a warfighting philosophy that seeks to shatter the enemy's cohesion through a variety of rapid, focused, and unexpected actions, which create a turbulent and rapidly deteriorating situation, with which the enemy cannot cope. The aim is to render the enemy incapable of resisting effectively by shattering his moral, mental, and physical cohesion—his ability to fight as an effective, coordinated whole—rather than to destroy him physically through incremental attrition. Maneuver relies on speed, the ability to focus efforts for effect, and surprise. Tempo is itself a weapon—often the most important. Firepower and attrition are essential elements of maneuver warfare. In fact, where strength has been focused against enemy vulnerability, attrition may be extreme. Nonetheless, the object of such local attrition is to eliminate a key element, which incapacitates the enemy systemically rather than systematically destroying the entire force. Maneuver warfare puts a premium on certain human skills and traits. It requires the temperament to cope with uncertainty and a flexibility of mind to deal with fluid and disorderly situations. It requires a certain independence of mind – a willingness to act with initiative and boldness to exploit every opportunity, and the moral courage to accept responsibility for independent action. This last set of traits must be guided by self-discipline and loyalty to the objectives of senior leaders. All warfare involves both maneuver and attrition in some mix. The predominant style depends on a variety of factors such as the overall situation, the nature of the enemy and most importantly, our own capabilities. The development of combined arms capabilities allows the Marine Corps' doctrine to favor maneuver warfare.

Marine Ethos and Combined Arms
An understanding of the concept of combined arms is crucial for understanding how Marines organize and how they view airpower. Combined arms goes beyond having the optimal weapon system at the right time. It is the simultaneous use of weapon systems that complement each other to achieve results the systems cannot obtain independently. A tactical level example is the complementary use of the automatic weapon and grenade launcher within a fire team. The automatic weapon pins an enemy down with high-volume, direct fire, making him vulnerable to the grenade launcher. If he moves to escape the grenades, he's engaged with the automatic weapon. Consider an example at the MAGTF level: Assault support aircraft quickly concentrate superior ground forces for a breakthrough. Close air support and artillery support the infantry penetration, while deep air assets interdict enemy reinforcements that move to contain the penetration. To defend against the infantry attack, the enemy must make himself vulnerable to the supporting arms. If he seeks cover from the supporting arms, the infantry maneuvers against him. To block the penetration, the enemy must reinforce quickly. However, in order to avoid the deep air, he must stay off the roads, which means he can only move slowly. If he moves slowly, he cannot reinforce in time to prevent the breakthrough. The enemy is in a no-win situation.

Marine Airpower Perspective
Airpower is clearly crucial to accomplishing the MAGTFs tactical objectives – it's a major part of the dilemma faced by the enemy. Given the criticality of his organic air to his basic warfighting philosophy, a MAGTF commander is not likely to gladly offer sorties for other uses. When joint doctrine was being developed, the issue of control over Marine air generated significant controversy. Today, the primary mission of the Marine air combat element is acknowledged to be support of the MAGTF ground combat element. The MAGTF commander will generally retain OPCON of his organic air. Still, the MAGTF commander recognizes there is one battle and it is the JFC's. This is a major cultural shift within the Corps since the early formulation of joint doctrine. Marines prefer Marine air, but will gladly utilize any services' airpower allocated to its use. The MAGTF commander must ensure the JFC understands the impact on the MAGTF if an allocation of Marine air to other priorities affects the MAGTF commander's ability to accomplish his mission or puts his forces in jeopardy. Policy states the MAGTF commander will make sorties available to the JFC, for tasking through the JFACC, for air defense, long-range interdiction, and long-range reconnaissance. Sorties in excess of MAGTF direct support requirements will also be provided to the JFC for the support of other components of the joint force or the joint force as a whole. Furthermore, nothing in the policy infringes on the authority of the JFC to redirect efforts such as the reapportionment and/or reallocation of any MAGTF TACAIR sorties when it has been determined by the JFC that they are required for higher priority missions.

USMC Summary
From the early years of World War One, Marine corps doctrine developed along with aviation, expeditionary warfare, and amphibious warfare. This parallel development led

to the evolution of the MAGTF. Success of the MAGTF relies on the commander's ability to combine all elements of combat power into one operation, not separate air and ground operations. Marines stress that air and ground forces must be a completely integrated team, with each having a shared picture of the other's environment. This shared environment is fostered by the Marine ethos – a way of thinking instilled by their doctrine and a common bond as riflemen. Marine aviation is fully integrated into the MAGTF. Airpower provides the fire power and battlefield mobility required by expeditionary forces that are relatively light in armor, artillery and mechanized mobility. While best utilized as a combined-arms team, Marines recognize there is one battle and that battle is the JFC's.

Lesson Summary
Each service requires the use of air and space power to perform its mission. The Army's conduct of decisive land combat relies heavily on the freedom of action, mobility, fire support, and information dominance provided by air and space forces. For the Navy, air and space power is a key instrument in achieving battlespace dominance and projecting power ashore. The Marine Air-Ground Task Force is a combined-arms team that consists of air and surface elements functioning as an integrated whole. Since air and space power is critically important to each of the services, each service desires to maintain at least some degree of control over it. Even though the individual services have differing views concerning the best way to employ air and space power, all agree that it's a necessary ingredient for successful military operations.

Operational Air and Space Power Lesson

Introduction

Keeping in mind what you have learned about air and space power in previous lessons, we will now look at how the Air Force applies that power at the operational level of warfare. Air Force officers need to understand the guidelines for organizing and employing air and space forces at the operational level of conflict across the full range of military operations.

The Air Force will usually fight as part of a joint force team. Other services also have air and space power assets. From your study of the principles of war and the tenets of air and space power, you know that airmen believe that air and space power should be centrally controlled by an airman and should be employed from a theater-wide perspective to achieve the goals of the joint force commander. This lesson looks at how the Air Force presents its forces for use by a joint force and its perspectives on joint air and space power employment.

Lesson Objective

The objective of this lesson is for you to comprehend the roles of the Commander of Air Force Forces or COMAFFOR and the JFACC in the operational employment of air and space power. To do this you should be able to explain the fundamental command and organizational concepts associated with air and space expeditionary forces. Next, you should be able to describe the COMAFFOR's role in joint operations. You'll be able to summarize the historical development of the JFACC concept and describe the JFACC's role in joint operations. Finally, you should be able to summarize the Air Force's position on joint doctrine issues concerning the JFACC.

Overview

This lesson is about how the US Air Force goes to war. We'll begin by looking at how the Air Force organizes itself to command air and space forces during operations. We'll look at the organization of the air and space expeditionary task force and the role of the commander of Air Force forces or COMAFFOR. The lesson then looks at commanding air forces in joint operations which involves the concept of the joint force air component commander or JFACC. We'll trace the historical development of the JFACC concept and look at what his current functions are. The JFACC concept continues to evolve so we'll finish by looking at some of the driving issues surrounding the JFACC concept.

Organization of Joint Forces

The nature of modern warfare demands that U.S. forces fight as a joint team. The screen portrays the possible components of a joint operation. It is important to note that the Joint Force Commander, or JFC, is a generic title for the commander of a unified command, a sub-unified command, or for the commander of a joint task force. The JFC chooses the capabilities needed from assigned Army, Air Force, Marine, and Navy forces. The JFC has a great deal of latitude on how to organize his joint forces. He may organize them by Service components as depicted here, or by functional components as displayed on the bottom portion of the diagram. Another option is for the JFC to

select a mixture of both service and functional components. During DESERT STORM, Gen Schwartzkopf designated a JFACC but did not name a joint force land component commander.

Air& Space Expeditionary Task Force

Let's look at the organization and leadership of the Air Force service component of a joint force. The Air Force component of a joint operation is called an Air and Space Expeditionary Task Force or AETF. Normally, it encompasses ALL Air Force forces which are part of the joint operation. Those forces represent a task-organized, mission-tailored package of air and space forces that exists for the duration of the joint force's mission. Whenever an AETF is established, its commander is called the Commander of Air Force Forces or COMAFFOR. The COMAFFOR serves as the single point of contact for the JFC and provides a clear chain of command for assigned or attached Air Force forces. An AETF can range anywhere in size from a single wing all the way up to a four star level MAJCOM.

AETF Composition

The AETF is the organization designated for providing air and space power wherever it is required. AETFs are packages of capabilities, normally established for a temporary time, to meet the specific needs of a theater combatant commander. The forces in an AETF are either deployed into the theater or are already in-place. The numbered Air Force, or NAF, is the senior warfighting echelon of the USAF. NAFs conduct theater air and space operations with assigned and attached forces. When participating in a major joint operation, the NAF presents USAF forces to the JFC within the framework of an AETF.

Air & Space Expeditionary Forces

The Air and Space Expeditionary Force or AEF concept is an organizational structure composed of force packages of capabilities that provide warfighting combatant commanders with rapid and responsive air and space power. The AEF concept utilizes 10 individual force packages and are designated AEFs one through ten. The ten AEFs together with their support and command and control elements are tailored to meet specific combatant commanders' requirements across the spectrum of response options. An AEF, by itself, is not a deployable or employable entity. Rather, AEFs deploy within an AETF as air and space expeditionary wings, groups, or squadrons. An air and space expeditionary wing, or AEW, consists of a command element plus operations, medical, logistics, and support groups. An air and space expeditionary group, or AEG, is the lowest command element below the COMAFFOR. An AEG is comprised of a command element along with several squadrons. The overall expeditionary concept is based on the premise that a rapid and effective military response is key to deterring or containing a conflict, seizing the initiative, and enabling follow-on response options.

AETF Command Structure

Shown here is a notional example of an AETF. Note that the COMAFFOR has a personal staff, special staff and an air operations center to enable the exercise of both

administrative and operational command. This example shows three air and space expeditionary wings that are either assigned to or attached to the AETF.

NOBLE ANVIL AETF
This is an actual example of an AETF from Operation NOBLE ANVIL, which was the US joint force operation complementing NATO's Operation ALLIED FORCE during the air war over Serbia. The COMAFFOR exercises authority through two separate branches of command. The warfighting branch flows from the Secretary of Defense through the European Command commander down to the commander of Joint Task Force Noble Anvil. The COMAFFOR derives his operational control or OPCON authority from the joint task force commander in order to accomplish assigned missions. With regard to the other chain of command, administrative control or ADCON flows from the Chief of Staff of the Air Force to the USAFE commander to the 16th Air Force commander who was the COMAFFOR for Operation Noble Anvil. The COMAFFOR takes operational orders from the JFC, but must also respond to the senior Air Force commander through the ADCON chain of command.

COMAFFOR Key Concepts
A COMAFFOR is designated in any joint operation. The COMAFFOR acts as the single Air Force air and space commander for the JFC. The COMAFFOR exercises command through the authorities shown on the screen. If you need to review command authorities and relationships, a link to Joint Pub 3-0 is provided. AFDD-2 spells out the COMAFFOR's specified ADCON and, when delegated, OPCON responsibilities. You may view a summary of those by rolling your cursor over them on the screen or linking to AFDD-2 for an expanded description.

Dual Chain of Command
In many joint operations, the JFC will designate a Joint Force Air Component Commander, or JFACC to control all air forces in the joint force. If the JFACC is from another service, the chain of command will split between the service component and functional component. The COMAFFOR will always perform his ADCON responsibilities but the JFC will determine the OPCON and TACON command relationships. When the Air Force has the preponderance of air assets in the theater and the ability to control those assets, the COMAFFOR will usually be dual-hatted as the JFACC. For Air Force forces, the functional and service chains of command merge.

Evolution of JFACC Concept
We've discussed the organization and command of today's air and space forces and the role of the COMAFFOR in presenting Air Force forces to the JFC. We've also mentioned the JFACC, a functional component commander who controls all air and space forces in a joint force. The JFACC is a relatively recent addition to joint doctrine but the concept of the JFACC has been around since the dawn of airpower. To better understand the role of and issues surrounding the JFACC, a look at the history behind the JFACC concept is important.

JFACC Evolution – Mitchell

Billy Mitchell was the chief of the Air Service of the First American Army during September 1918 in the final months of World War One. He recognized the need for centralized control of offensive air operations. He requested that all air missions of American Army units, French units attached to the American Army, the French Air Division, and the French Night Bombardment Wing be assigned to him for execution. By concentrating almost 1500 allied aircraft in direct support of forces in the Saint. Mihiel offensive, Mitchell achieved both mass and unity of effort. With his command, Mitchell had a theater-wide view of the battlefield. His efforts during this period were so successful that the allies had another full-scale air attack planned for the Spring of 1919. However, the armistice in November 1918 prevented any further experience with central control of air forces at this level. Although General Mitchell wasn't called a Joint or Combined Forces Air Component Commander, he certainly functioned very much like one.

JFACC Evolution – Kenney

During World War Two, General George Kenney's leadership and organizational ability for air power employment have led many to call him the prototype of today's JFACC. Initially, General MacArthur's southwest pacific campaign consisted of delaying actions and withdrawals. In July 1942, the campaign's nature changed when General George Kenney assumed duties as MacArthur's air commander. Kenney's vision, organizational skills, understanding of sister service operations, and personal relationship with MacArthur helped him take the offensive and set the pace for the overall joint campaign in the theater. Given complete and acknowledged command and control of all Southwest Pacific area Army Air Forces, Kenney reorganized, reallocated resources, streamlined logistics, and devised an air campaign that was the critical element in MacArthur's island-hopping strategy. Equally important, General Kenney recommended Army and Navy operations that supported his air operations. Kenney's familiarity with and competence in Army and Navy matters proved indispensable for planning and fighting joint campaigns.

JFACC Evolution- Momyer

Following World War Two, the Air Force had great difficulty in gaining acceptance of the concept of a single air commander. Both the Korean War and the Vietnam War lacked a unified and integrated air campaign. This resulted in incoherent operations, some at cross-purposes. Throughout both wars, land and air campaign planning lacked sufficient coordination. At the time, at least one Air Force leader, General William Momyer, believed in and stressed the need for centralized control of Air Forces. General Momyer served in World War Two, Korea, and Vietnam and retired from the Air Force in 1973. General Momyer was the single air commander during the Battle of Khe Sanh during the Vietnam War. In his book, *Air Power in Three Wars*, he discussed developing a command structure where all theater assigned assets are placed under a single unified commander. He advocated that those forces should be subdivided under this commander into components for land, naval, and air forces. General Momyer cited Khe Sanh, among other examples, to explain his rationale for having a single airman in control of the air battle. He advocated having unified commands organized along

functional rather than service lines. Today, the JFACC serves as a functional commander, similar to the way Momyer described him.

JFACC Evolution – Post Vietnam
Following the Vietnam War, the first unified command to establish a functional air component within its organizational structure was the Rapid Deployment Joint Task Force, or RDJTF. President Carter established the task force in response to the Iranian hostage crisis in 1979. The RDJTF evolved into a true joint command and eventually became what is now U.S. Central Command. The first joint publication to formally use the term "JFACC" was the old JCS Pub 26, titled "Counterair Operations from Overseas Land Areas." Within a short time this publication became Joint Pub 3-01.2, "Joint Doctrine for Theater Counterair Operations" and provided a foundation upon which the JFACC concept could evolve. The Marines, however, became concerned over the Air Force's push for a functional air component within unified commands. Fearing a loss of required air support from their Marine Air-Ground Task Force or MAGTF, the Marines got the services to sign up to the Omnibus Agreement. This agreement stated that the MAGTF commander would retain operational control of all Marine air assets and make available for tasking by the JFACC, only those sorties in excess of his direct support requirements. However, the publication went on to state that the JFC had the ultimate authority regarding the use of MAGTF tactical air sorties. The provisions of this agreement are now included in Joint Pub oh two.

Early JFACC Exercises
The JFACC concept was first implemented in two major joint exercises, OCEAN VENTURE 88 AND SOLID SHIELD 89. The doctrinal disagreement continued over the role of the JFACC. The principal argument stemmed from whether the JFACC was a coordinator or a commander. Naturally, the Air Force believed the JFACC required command authority in accordance with the tenet of centralized control and decentralized execution. In exercise SOLID SHIELD 89, joint doctrine specified that one of the component commanders, presumably the one with the most air power and the ability to command and control forces at the theater level, would be dual-hatted as the JFACC. In this case, the Air Force component commander should have been dual-hatted as the JFACC. What actually happened in SOLID SHIELD 89 was that the JFACC was merely a staff organization working for the JFC. In other words, the JFACC had no command authority. At most, the JFACC acted as an overall coordinator for the air effort. This command arrangement was similar to the manner in which air power was applied during the Vietnam War. The arrangement was a far cry from the way in which airmen envisioned the concept. Not surprisingly, the Air Force component cited exercise SOLID SHIELD 89 as a failure!

Impediments to JFACC Concept
There were many problems that impacted the development of the JFACC concept in joint publications. The services each had their views on the best way to use air power. These views were primarily based upon individual service perspectives regarding air power. There were a few other factors, that hampered development of the JFACC concept. First, sketchy joint publications lacked details regarding the JFACC concept.

Second, there were virtually no universally accepted procedures or techniques for implementing the JFACC concept. There was, and unfortunately still is, a lack of institutionalization both within the joint world as well as in the Air Force itself. Joint doctrine gives each theater JFC a great deal of latitude on how to implement the JFACC concept. Additionally, there is a lack of standardization among the numbered Air Forces within the USAF on how they institute the JFACC concept. Although the Air Force has made some progress regarding standardization in its Numbered Air Forces and Air Operations Centers, work still remains to be done.

JFACC in Desert Storm
The first effective utilization of the JFACC concept occurred in DESERT STORM. During DESERT STORM, the JFC provided the necessary guidance and direction to the JFACC. The JFACC staff planned and executed the air campaign plan and controlled all overland fixed wing assets. In other words, all overland fixed wing assets were tasked on his air tasking order. In spite of the problems associated with any new organization, there was good cooperation among the services and, especially among the allies in the coalition.

JFACC in Joint Doctrine
The final portion of the lesson focuses on the JFACC concept, as it currently exists in joint doctrine. The JFC normally designates a JFACC to integrate and exploit the joint air power capabilities of different nations, services, and components. Joint air operations are planned and conducted to maximize the total combat power and synergy of the aggregate air effort in support of the JFC's operation or campaign plan.

Selecting a JFACC
 The criteria for designating a JFACC are outlined in the current joint doctrine. The JFC will normally designate a JFACC. The designation is based on the following factors: the JFC's overall mission and concept of operations; The missions and tasks assigned to subordinate commanders;· The availability of forces;· The duration and nature of desired joint air operations;· And the degree of unity of command and control required for the joint air operations. Having considered these factors, the JFC normally assigns JFACC responsibilities to the component commander who has both the preponderance of air assets and the capability to effectively control and orchestrate air forces at the theater level.

JFACC Authority and Responsibility
Once designated, the JFACC derives authority from the JFC. In other words, based upon a particular situation, the JFC decides what level of authority the JFACC will have. Joint doctrine suggests that the JFACC's duties normally include, but are not limited to, planning, coordinating, allocating, and tasking as specified by the JFC's apportionment decision. It is important to remember the following: the JFACC recommends apportionment of air resources to the JFC, but it's the JFC who makes the final decision. Ultimately, the person deciding how air power is to be used, in broad terms, is the JFC. Other responsibilities the JFC normally assigns to the JFACC include duties as

the Area Air Defense Commander and the Airspace Control Authority. More information about these duties is available by placing your cursor over them.

Supported/Supporting Commander
The JFACC functions as the supported commander for theater counterair operations, strategic attack, theater reconnaissance and surveillance, and the overall air interdiction effort. As an added note, the JFACC is normally the supported commander for the entire interdiction effort, not just air interdiction. The JFACC further functions as the supporting commander, as directed by the JFC, for operations such as close air support, air interdiction within the land and naval component areas of operation, and maritime support. For more information on supported and supporting relationships, link to Joint Pub oh two.

Purpose of JFACC
The primary purpose of the JFACC, as outlined in Joint Pub three oh, is to provide unity of effort for employing air and space forces and other capabilities made available for tasking by the JFC. As a functional commander, however, the total air and space assets available to the JFACC may vary greatly. Here's a look at the assets, which may be available to the JFACC in a typical theater. The Army's aviation assets may be retained by an Army corps for employment as organic forces. Current Army doctrine considers Army aviation forces as maneuver units. Depending upon the particular situation, the theater of operations, the construct of the battlespace, tasking, and target location some Army aviation assets, such as the Army tactical missile system, or ATACMS, and deep attack helicopters may be available to the JFACC. Naval aviation assets may be retained, if needed, for fleet defense and related naval missions. Sorties in excess of those needed to satisfy maritime air operations are normally made available to the JFACC for tasking. Additionally, because of their deep strike capability, some Tomahawk Land Attack Missiles may be provided to the JFACC.

Marine aviation assets are part of the Marine Air-Ground Task Force or MAGTF. The MAGTF commander retains operational control of organic air assets. Nevertheless, joint doctrine states that the MAGTF commander will make sorties available to the JFC for air defense, long-range interdiction, and long-range reconnaissance missions. The Joint Force Special Operations Component Commander or JFSOCC exercises operational control over all theater-assigned joint special operations forces. Due to the unique nature of their mission, the JFSOCC normally executes centralized control of special operations aviation through his Joint Special Operations Air Component Commander. However, some special operations air assets may be made available to the JFACC. Lastly, during multi-national operations the JFACC may be named the Coalition Force Air Component Commander or CFACC and exercise tactical control of coalition aviation assets.

JFACC Command Responsibilities
The JFACC typically exercises operational control known as OPCON over assigned and attached forces and tactical control or TACON over other forces made available for tasking. Some air-capable assets, such as the Army tactical missile system and the

Navy's Tomahawk Land Attack Missiles, normally remain under the operational control of respective component commanders. The biggest difference between operational control and tactical control is that tactical control does not provide organizational ability. Specifically, while tactical control includes the authority for the direction and control needed for accomplishing assigned missions or tasks, it does not give the commander the authority to reorganize units. Normally, the JFACC needs only tactical control or a support relationship to conduct operations that employ augmenting forces, which remain assigned to other components. Support relationships are defined as a command authority. A superior commander establishes a support relationship between subordinate commanders where one commander's organization aids, protects, complements, or sustains another. For a detailed explanation of command relationships, link to Joint Pub 3-0.

JFACC Operations
Procedures for joint air operations are designed to exploit the flexibility of air and space power in order to achieve joint force objectives, while providing support to component operations. In large-scale, joint air operations, the assignment of a JFACC ashore is normally desirable because of the enhanced logistics, communications, and facility capacity afforded by land-based operations.

JFACC Basing Options
The location of the JFACC, whether sea-based or land-based, is dependent on the particular situation. Occasionally, the JFACC may operate from a sea-based location. The location of the JFACC may be viewed along a continuum as shown here. In a joint operation, a carrier battle group, by itself, can establish the initial airspace control and area air defense network. Additionally, the battle group has the requisite command and control to conduct initial small-scale joint air operations. A sea-based JFACC, shown in level two of the continuum, can support enabling operations or joint air operations up to about 500 sorties per day. When the scale of operations increases, it then becomes necessary for the JFACC to transition from afloat to ashore. Upon completion of any major conflict, JFACC operations could once again transition back to the sea-based option, if necessary.

Differing Perspectives of JFACC
Current development efforts in joint doctrine address numerous aspects of military organization for warfighting. Each of the services still has its own views for the best way to employ air and space power--views that are primarily based upon individual service perspectives regarding the application of air and space power. Joint doctrine gives joint force commanders a wide degree of latitude on how to implement the JFACC concept. It's important to understand how their service perspective may influence this. The next few screens explore several contentious joint issues and provide insights surrounding the different perspectives.

Integration of Assets
The JFACC's ability to integrate air assets in accomplishing theater objectives is probably the most fundamental issue surrounding the JFACC concept. Joint and service

doctrines and agreements give the JFACC control of only part of the total available theater air assets. However, the airman's perspective holds that theater objectives may be attained through the centralized control and unified employment of all air assets. On the other hand, each of the other services depends on its respective air arm to shape the battlespace as part of its combined arms team. The JFC has to carefully balance the surface commander's perspective, which is primarily geographic in nature, against the functional or theater-wide perspective of the JFACC. The bottom line is, the JFC has to insure that apportionment decisions support the overall strategy to achieve the campaign objectives.

Interdiction and Deep Operations
The JFACC and the Special Operations Component Commander are the functional component commanders with forces at risk beyond the fire support coordination line, or FSCL. Air provides the vast preponderance of deep attack assets and the JFACC is uniquely capable of planning and controlling operations in territories occupied by hostile forces. Land Component Commanders are the supported commanders within their area of operations. They synchronize maneuver, fires, and interdiction. To facilitate this synchronization, such commanders have the authority to designate the target priority, effects, and timing of fires within their areas of operation. The theater perspective provides that the responsibility for interdiction and deep operations should be vested in the commander who has the preponderance of attack assets and the command and control capability to conduct those operations. The question becomes how deep is deep? The FSCL is often used as the answer and the debate surrounding its placement is often resolved by the JFC.

Theater Air & Missile Defense
Maximizing the effectiveness of theater air and missile defense assets is a cornerstone of air and space superiority. Airmen maintain that centralized control of theater air and missile defense provides unity of effort, integrates complementary effects of weapon systems, minimizes the possibility of fratricide, and best utilizes limited theater assets. The Area Air Defense Commander, who normally is also the JFACC, needs the authority to integrate all air and missile defense assets. Other services believe that active missile defense is separate from air defense of aircraft and separate from JFACC and Area Air Defense Commander control. They propose a stand-alone command and control architecture for missile defense. Overall, Joint Publication three oh one, Joint Doctrine for Countering Air and Missile threats, gives the authority for integrating air defense forces to the Area Air Defense Commander.

Summary
This lesson covered the operational level employment of air and space power by first presenting fundamental command and organizational concepts. Concentrating on the presentation of USAF forces in a theater of operations, the lesson outlined how the air and space expeditionary task force or AETF serves as the organizational construct for USAF forces in the field. The lesson presented how the COMAFFOR serves as the single point of contact for air and space capabilities. The second major area covered in the lesson was the concept of the Joint Force Air Component Commander or JFACC.

The lesson traced the historical roots of the JFACC concept and then examined the JFACC in today's joint doctrine. The lesson finished by looking at the various perspectives on issues surrounding the JFACC.

Air and Space Expeditionary Force

Intro
Since its inception as an independent and separate service in 1947, the Air Force has participated in numerous contingencies around the globe. Air and space forces have continually exploited the speed, range, precision, and flexibility of air and space power. However, personnel and financial cutbacks along with increasing worldwide obligations have impacted the Air Force's ability to effectively meet its commitments. The Air Force has now adopted a concept called the Air and Space Expeditionary Force, or AEF. The AEF concept embodies the Air Force's 21st century vision to organize, train, equip, and sustain its future Total Force—Active, Air National Guard, and Air Force Reserve—to meet the security challenges of the 21st Century. It is important to understand this concept and its relationship not only to Air Force doctrine but also to the national military strategy and national security strategy. The material presented in this lesson will enable you to understand how the Air Force is restructuring and reorganizing its forces to meet the demands of the 21st century.

Lesson Objective
The objective of this lesson is for you to comprehend the impact of the AEF concept on the Air Force. At the end of the lesson, you will be able to identify factors that necessitated the change to the AEF concept. You will be able to describe the objectives, attributes, and characteristics of the AEF. Finally, you will be able to describe the role and function of the 10 Air and Space Expeditionary Forces in the AEF concept.

Overview
The lesson begins by discussing the background that led to the development of the AEF concept and continues by looking at its characteristics. The next main point explains the force management tools associated with the concept. The lesson then presents the AEF rotational cycle along with notional examples of AEF force alignment. The lesson continues with a presentation of the AEF concept across the spectrum of conflict. Lastly, the lesson looks at how the AEF responds to crises and reviews projections regarding the future of the AEF concept.

Expeditionary Operations
Expeditionary operations have a solid foundation in the National Military Strategy, Joint Vision 2020, and Air Force Vision 2020. The Air Force's AEF concept vision for the 21st century is to enhance the expeditionary mindset throughout the total force to include the active duty, national guard, and reserve forces. Air and space expeditionary forces are packages or buckets of capability designed to meet the requirements of the Joint Force Commander.

Evolving National Security Strategy
Since the downfall of communism, there has been a significant change in our national security strategy. Previously, the United States was faced with "containing" a single

threat. Under a national security strategy of "containment," the US Air Force fought from forward bases and deployed forces from stateside to a well-established infrastructure. During the latter part of the Cold War Era, the Air Force had more than 50 forward-deployed overseas bases and personnel strength at the time numbered approximately 570,000.

Basing Changes
This chart reflects the names and geographic locations of the Air Force's Cold War era forward bases. During this era, the Air Force operated from a garrison state and was supported by robust basing and manning. The garrison state enabled the Air Force to successfully contribute to the national strategy of "containment." Following the breakup of the former Soviet Union and the aftermath of the Gulf War, the Air Force has experienced a dramatic draw-down in both basing and personnel. The Air Force has undergone a major transition and now has two-thirds fewer forward bases than it had in the Cold War Era. Although there has been a decrease in forward basing and the number of Air Force personnel, neither the operations nor the personnel tempo has diminished and, in fact, both have substantially increased. Even with decreased basing and manning, the national security strategy mandates that the Air Force remains globally engaged.

Basing Changes 2
Since the breakup of the former Soviet Union, the security environment remains highly unpredictable, consisting of numerous potential adversaries with the ability and will to threaten regional stability and US national interests. To meet this threat, the Air Force developed concepts and capabilities that exploit the strengths of air and space power and follow our doctrinal guidelines. Today, the Air Force employs a strategy that must be executed with significantly fewer forces and from far fewer forward-operating locations.

Current National Security Strategy
Under the mandate of the current National Security Strategy, the Air Force must maintain its readiness worldwide. In what has become known as the 4-2-1 strategy, the US military must be able to deter in four geographic areas, fight in two separate theaters, and win decisively in one theater. The service must also be prepared to respond to "pop-up" political, diplomatic, and military crises as well as emergency humanitarian relief operations. The Air Force continues to remain globally engaged, is accomplishing a multitude of missions, and is frequently deployed to locations with the barest supporting infrastructure.

Temporary Basing
To meet these and other contingencies, the Air Force has supplemented its forward bases with temporary basing agreements. Because these temporary bases were neither planned for nor programmed into the operating budget, they are operated, manned, and staffed from existing resources. The temporary bases are operated with rotational forces that deploy for 90-120 days. Consequently, these rotational assignments have placed great stress on resources—both personnel and equipment.

From Containment to Engagement
As the national security strategy shifted from a focus on containment to that of engagement, the Air Force Vision also changed to cope with the new challenges of the 21st century. Overall cuts in personnel numbers, budget dollars, and overseas bases, combined with the fourfold increase in operational missions, created an atmosphere of frequent, unplanned deployments—all of which represent underlying reasons for the AEF concept. The expeditionary concept is the Air Force's approach to implementing the operational concepts originally outlined in Joint Vision 2010 and reiterated in Joint Vision 2020. The Air Force believes that the AEF concept is a more effective and efficient use of air and space power.

AEF Characteristics
The AEF concept represents a systematic and organized approach for rapidly presenting forces that are light, lean, and tailored to meet the needs of theater combatant commanders. The concept improves the integration of the Total Force by using the Guard and Reserve in a much more effective way than has been done in the past. AEF organizes the Total Force to provide greater capability, while at the same time creating greater stability and predictability for Air Force people. The AEF concept is not a risk to a theater combatant commander's ability to execute regional Operation Plans or OPLANs. If a major theater war erupts, the Air Force either will deploy personnel and conduct missions in accordance with the combatant commander's OPLAN or respond to unfolding events via crisis action planning. In today's 4—2—1 strategy, the Air Force is tasked to rapidly respond to a wide variety of combatant commanders' requirements. With this mandate, all resources must be postured to respond to a variety of contingencies. Finally, the AEF concept will be codified in the Air Force's Global AEF Presence Policy.

Traditional Organization
The traditional Air Force organizational structure is depicted on this screen. The traditional, vertical alignment of major commands, numbered air forces or NAFs, wings, groups and squadrons still exists. With this arrangement, units aligned under NAFs generally remain within that NAF for war-fighting purposes unless specifically tasked to deploy and augment another NAF. When it comes to war fighting, the Air Force has traditionally deployed air and space power in the form of squadrons that come together to execute the combatant commander's mission. For example, Air Force aircraft in 16th Air Force would fly and fight in the European Theater and be augmented, as necessary, by stateside aircraft from Air Combat Command.

AEF Organization
The AEF concept seeks to provide additional structure to the deployment of Air and Space power through the use of the AEF. Instead of the traditional vertical alignment of forces, squadrons and units from different NAFs come together to comprise an AEF. Hence, an AEF contains a mixture of squadrons with complementary capabilities drawn from different NAFs and MAJCOMs. These forces are drawn from across the active duty, Air Force Reserve, and Air National Guard commands from around the world. In

essence, an AEF is a force management tool that can be tailored to provide the full range of Air and Space power capabilities to satisfy a regional combatant commander's requirements.

AEF Construct
The 10 AEFs are the fundamental elements of the AEF concept. They represent a blending of the forces, capabilities, and equipment that can respond rapidly to many contingencies across the full spectrum of operations. An AEF can be thought of as a "bucket," that contains a cross section of Total Force capabilities and personnel from most specialties. Total Force integration of Air Reserve Component personnel, equipment, and aircraft into AEFs allows the Air Force to effectively manage the force and personnel tempo. AEFs provide more responsive force packaging, better visibility into force tempo, better detection when the force is stressed, and a mechanism for focusing relief on stressed areas. Because each AEF draws forces from across the total force, each has roughly equivalent capabilities that are composed of fighter and bomber squadrons, assigned theater lift and tanker forces, tactical leadership, and a full complement of combat support. The objective is to pre-identify as many deployable people and assets as possible in order to distribute deployment loads.

Force Requirements
To determine the requirements necessary for implementing the AEF concept, Air Force leaders reviewed the Air Force's steady state requirements for the period between 1992 to 2002 shown, in part, here. The review showed that ongoing deployments to Southern Watch, Northern Watch, Bosnia, and other deployments to pop-up contingencies required a maximum of approximately 350 aircraft. The formulators of the AEF concept took this figure into account when building the capabilities contained in individual AEFs.

Force Composition
Air Force leaders decided that 10 AEFs are needed to meet current and future force requirements. Each AEF is composed of approximately 150 to 175 aircraft; however, each does not necessarily contain the same types of aircraft. Rather, each AEF has similar capabilities. Most fighter and bomber units are incorporated into the AEFs, although there are some exceptions. Because of their commitment to combatant commander OPLANS for defense of the Korean Peninsula, forces in South Korea are not incorporated into AEFs. There are also some limited forces that have to be managed carefully, so that they can support the AEFs. These forces are the low density, high demand or LD/HD assets, such as AWACs, EC-130 compass call electronic warfare platforms, and U-2 aircraft. LD/HD assets are not managed under the same training and deployment cycle as AEFs. They are managed by the Joint Staff under the Global Military Force Policy or GMFP. For more information on LD/HD assets or the GMFP, click the appropriate link on the screen.

Force Composition 2
AEFs are paired to define the level of deployment the Air Force can sustain over time. This sustainable commitment is measured in terms of combat power, independent expeditionary combat support deployments, and the number of forward operating

locations that can be supported. AEFs themselves do not deploy. Deployable elements of the AEFs are the Air and Space Expeditionary wings, groups, and squadrons. Click on the link for a notional example of two AEFs.

AEF Employment Concept
This graphic is an example that illustrates the AEF employment concept prior to September 11, 2001. As you can see, one AEF would have forward deployed forces that support Operation Southern Watch along with Operation Enduring Freedom and Operation Noble Eagle for the air defense of the United States. The other AEF would have forward deployed forces supporting the remaining steady state requirements depicted on the screen. The remaining forces from both AEFs remain at the home station in an on-call status. At this time forces from the on-call Air and Space Expeditionary Wing, or AEW, were postured to respond to potential pop-up contingencies. Those on-call AEWs were located at Mountain Home and Seymour-Johnson Air Force Bases. Currently, the AEF response is twofold. The first response is to the ongoing steady-state operations and secondly, to the Global War on Terrorism.

Lead Wing
Each AEF has a designated lead wing that may provide tactical level leadership for the AEF along with operational and support elements to meet the requirements of the supported combatant commander or Commander of Air Force Forces. Lead wing commanders are responsible for training within their own wings and also for certifying the wing's combat capability. However, lead wing commanders are neither responsible for the training of other units assigned to their AEF nor for certifying the readiness of those units for deployments. Responsibility for the training of units assigned to an AEF rests with the parent wing. Lead wing commanders do not command the AEF. If deployed to an expeditionary location where there is no pre-existing command structure, the lead wing commander falls under the command of the gaining combatant commander or the designated joint force commander.

Lead Mobility Wing
One of the force management tools in the AEF concept is the lead mobility wing or LMW, which copes with crises that are mobility-centric in nature. There are two LMWs, which are located at McGuire Air Force Base, New Jersey and Travis Air Force Base, California. A lead mobility wing provides a cadre of leaders for small-scale contingency operations, such as civic actions, humanitarian relief, and civil catastrophe response. These wings provide "on call" mobility leadership for a rapid response to any mobility-centric operation. The LMW commander has no command authority. Instead, the commander is the single point of contact and provides management oversight of the selected CONUS unit sourcing, training, readiness, and deployment/redeployment actions. LMWs can also provide the expertise needed to assess the status of mobility requirements, such as reception airfield capabilities and follow-on force requirements.

AEFs in Joint Force

AEFs themselves do not deploy. Instead, their elements deploy as Air and Space expeditionary wings, groups, and squadrons. Once deployed, AEF elements become part of an Air and Space Expeditionary Task Force or AETF. The AETF is the overall organization that consists of all Air and Space expeditionary wings, groups, and squadrons assigned or attached to a joint task force. Because the AETF is part of a joint task force, the AETF commander is also the Commander of Air Force Forces, or COMAFFOR. This graphic illustrates how a deployed AEW would be integrated into the joint task force structure.

AEF Cycle

To facilitate the goal of better force management, AEFs operate on a cycle. This cycle defines the policies and procedures by which forces rotate through scheduled deployment requirements. AEFs, combined with new force policies, allow the Air Force to better schedule units for deployments, thus making the process much more predictable to Air Force personnel. AEFs are scheduled on a 15-month rotational cycle, and each AEF is eligible for deployment for 90 days during the cycle. This predictability is key to the effective use of Air Reserve Components within the AEF concept. To facilitate reduced personnel tempo, each individual can only be aligned to one AEF. The objective of reduced personnel tempo is to limit personnel deployments to a maximum of 120 days per year.

AEF Cycle

The rotational structure provides roughly 10 months of normal duty. This time allows units to reconstitute equipment and to accomplish required training. This normal duty time also allows units to conduct the day-to-day business of gaining and maintaining proficiency and combat readiness. In addition, the normal duty time provides Air Force members an opportunity to spend quality time with their families. Roughly two months prior to deployment eligibility, AEFs enter a preparation period. During this time, units are notified of where and when they will possibly deploy and when final deployment and beddown planning will be accomplished. Units also receive area of responsibility orientation, theater intelligence and threat briefings, and rules of engagement training. Once units enter the deployment eligibility period, they either deploy forward or remain at home in an on-call status for 90 days. After each deployment eligibility period, units that deployed will receive up to two weeks of recovery time. The recovery period is based on the length of time deployed and existing policies. The two-week recovery period marks the beginning of the 10-month training and exercise period. Note that under extenuating circumstances, such as the Global War on Terrorism, which initially occurred in AEF Cycles 2 and 3, the AEF tour length can be extended from 90 up to 135 or even 179 days.

AEF Rotation Schedule

This graph shows the rotational cycle for each of the paired AEFs. It also shows the lead wings and lead mobility wings for each rotational cycle. This rotational construct enables AEF members to know when they are in the window for deployment, when they will be in spin-up for deployment, and when they will be in normal duty status. Hence,

members can plan their lives accordingly. The 15-month schedule, Total Force integration, and the force management rules should provide tempo predictability and stability for AEF members.

AEF Force Alignment
Let's examine what an AEF looks like. This chart represents the capabilities in a notional AEF. Units on this screen represent a cross section of the weapons systems assigned to the AEF. Active duty units are depicted in blue, Air National Guard Units are in yellow, and Air Force Reserve units are in red. Each unit contributes a specific capability to the AEF. For instance, active duty units from McGuire and Travis provide airlift capability through KC-10 aircraft. Air National Guard units from South Dakota and Iowa provide air superiority through F-16 aircraft. Finally, reserve units from Fort Worth, Hill, Homestead, and Luke provide precision guided munitions support through F-16 CG aircraft. This alignment of forces illustrates how the Total Force concept is used to provide the necessary warfighting capabilities to the AEF.

Expeditionary Combat Support
This graphic depicts the expeditionary combat support or ECS for a notional AEF. As you can see, the support requirements are filled from across the active, guard, and reserve forces.

AEF Vision across the Spectrum
This graphic illustrates the AEF concept across the spectrum of conflict. The "steady state" of ongoing deployments is represented by the dotted line. The Air Force has a "steady state limit" on forces, which totals the capabilities of about two AEFs. This limit equates to approximately 20% of the Air Force's combat coded force, which is represented by the solid blue line. A steady state limit also applies to LD/HD assets, but their percentage is governed by the Global Military Force Policy or GMFP. A trigger point, as shown on the graphic is encountered if any of the following situations arise: when operational requirements cause the Air Force to employ more than two AEFs; when demands for use of LD/HD assets exceed that which is allowed in the GMFP; or when demands placed on the strategic mobility force go beyond steady state operations. At the trigger point, the Air Force transitions in a surge. A surge is defined as continuing operations beyond what can be sustained indefinitely. Surge operations may escalate into a Major Theater War or MTW or become so intensive that existing OPLANs may be put at risk. Additionally, Air Force leaders may elect to "roll forward" into the next pair of AEFs to tap critical capabilities required to respond to an expanding crisis. As the Air Force surpasses the surge point, national leadership may begin to seriously consider selective disengagement from steady state commitments. Selective disengagement would result in fewer forces being available to support ongoing requirements such as those in Southern Watch and Northern Watch. Once surge operations are initiated, the Air Force progresses beyond the limits of the AEF concept. At this point, Air Force senior leadership must inform the national leadership of requirements that exceed sustainable commitment levels. Going beyond any trigger point should cause the Air Force to begin planning for some form of recovery and, if necessary, reconstitution. Factors to consider in reconstitution planning include levels

of consumables and munitions expended, magnitude and duration of the contingency, lost training, and personnel attrition rates.

AEF Issues

Air Force leaders may face major issues as they see how the AEF concept is affected by operations across the spectrum of conflict. One issue involves determining how to select forces to respond to the transition to surge operations. The selection process should minimize the disruption of AEF cycles after surge operations have ceased, yet also balance against combatant commander requirements for mission accomplishment. A second issue is how to reconstitute so that forces can recover to the AEF cycle as quickly as possible. Another issue regards the level of steady state commitments after any large-scale contingency. More specifically, how will steady state commitments change? Because the AEF concept is still evolving, Air Force leaders are faced with these and other issues. Current operations along with ongoing steady state requirements may provide leaders with the insight and experience to effectively deal with these issues.

Lesson Recap

This lesson explained how factors, such as declining personnel numbers, reduced overseas basing, increased deployments, and a change in national security strategy, served as a background for development of the AEF concept. The AEF concept was characterized as a systematic and organized approach for presenting forces to meet the theater commander's needs. The lesson then described how the AEF concept fits into the current Air Force organizational structure. The AEF construct was described as a force management tool for implementing the AEF concept. This main point included an overview of AEF force requirements, composition and alignment, and also an explanation of how the AEF construct fits into the joint task force organization. The 15-month rotational cycle of AEFs was presented, along with examples of AEF force alignment. The lesson ended with a discussion of the AEF concept across the spectrum of conflict.

Summary

Today's Air Force faces a new challenge. The national security strategy of engagement means that we are always the visiting team. The absence of robust overseas basing and the reality of temporary overseas bases have compelled Air Force leaders to adopt a new vision— the AEF concept. The AEF is about embracing and understanding the concepts and implications of engagement and presence as articulated in our current Air Force vision. The AEF concept reaffirms the vital role of air and space power across the full spectrum of military operations. It is recognition of the growing tendency to employ air and space power frequently and over sustained periods as a part of the national military strategy.

Joint Doctrine Issues

Introduction
This lesson will introduce you to some of the current joint issues concerning the employment of air and space power. The emphasis is on current issues and to facilitate currency, this lesson will provide a link to the latest joint doctrinal issues.

Overview
Before examining actual doctrinal issues, you must know the foundations of those issues. First, it is important to remember that our sister services require air and space power in order to conduct successful operations. For example, the Marine Air-Ground Task Force is a combined arms team that consists of ground and air elements. Second, Army doctrine articulated in Field Manual 3-0 relies on the full spectrum of air and space power in its operational concepts. Finally, the Navy employs air and space power as its primary power projection tool. It stands to reason, then, that each service desires a degree of control over the air and space power within its areas of operation, whether its own organic air, or that provided by another service.

Differing Service Perspectives
Keeping in mind that each Service requires air and space power, the differing service perspectives on air and space power employment center on how each Service views two fundamental issues. The first concerns the role of air and space power in joint operations. The second issue, the proper employment of air and space power, actually concerns joint warfighting philosophy in general. We'll now explore these two areas individually.

Role of Air and Space Power
 What is the proper role of air and space power in joint operations? If a service believes that air and space forces are truly an equal partner and can, in many circumstances, be as decisive as surface forces, then that service probably believes that air and space forces should be assigned tasks and objectives that are independent of surface operations. However, if a service believes that air and space forces primarily provide services to surface forces, the service probably advocates that air and space operations be inextricably tied to decisive surface operations. It should be obvious, then, that a service's view on the role of air and space power in joint operations influences its belief on how much command and control surface commanders should have over air and space operations.

Employment of Air and Space Power
A service's overall warfighting philosophy heavily influences how it employs its forces, including air and space forces. If a service believes that integrated theater-level operations are the key to success in joint operations, the service probably advocates that theater-level missions like interdiction, strategic attack, and counterair should be centrally controlled at the theater level. It would follow that air and space forces, which are heavily used in such missions, would also be controlled by a theater-level air

commander. Conversely, if a service believes that synchronized, but separate, component operations are the key to joint success, the service probably argues for component commander control of all operations, including air, within the component's area of operations. Ultimately, the issues of the role of air and space power and its employment translate into two real-world doctrinal differences: targeting responsibility; and functional versus geographic command.

Targeting Responsibility

 Consider how a service's views on joint warfighting and the roles of the various service components would affect its view on targeting responsibility. If you believe in the primacy of component operations and that air and space power is primarily a provider of services for surface forces, then you probably believe that surface force commanders should have the final say in target selection. On the other hand, if you believe that air and space forces are truly an equal partner in joint operations and should be employed in support of theater objectives, then you probably believe that a theater-level air and space commander should have the final say in target selection.

Functional versus Geographic Command

 A service's warfighting philosophy also affects its view of how commands should be organized. If you believe that individual component operations, synchronized in time and space, are key to success, then you probably advocate geographic command, in which a single commander controls *all* operations within a designated geographic area. Conversely, if you believe that integrated theater-level operations are the key to success in joint warfare, then you probably advocate functional command of air and space power under a single air and space commander. Issues involving targeting responsibility and functional versus geographic command form the basis for many of the key doctrinal "friction points" among the Services.

Summary

In reality, the individual service views on these issues probably lie somewhere between the extremes presented. Since specific doctrinal issues change often and are constantly evolving, they will not be discussed here. The Air Force Doctrine Center's web site contains a wealth of information on the various joint doctrinal issues involving the application of air and space power. The "Applications" section of the web site contains information on doctrine issues and initiatives, while the "Doctrine Watch" section contains short articles on a variety of air and space doctrine concepts. As you explore the current joint issues on the Air Force Doctrine Center's web site and elsewhere, keeping these fundamental issues in mind will help you understand the differing perspectives and positions the various services take on specific issues involving air and space power. While the multiple perspectives on issues involving the proper employment of air and space power in support of our national goals and objectives are varied and often quite complicated, the basic foundations of those ideas are far less complicated.

Evolving Air & Space Power Concepts

Introduction

Since emerging as a separate service in 1947, the Air Force has been at the forefront of technological advances and evolving employment concepts. Air and space forces have continually exploited the speed, range, precision, and flexibility of air and space power to better serve the nation. In furtherance of that service, the Air Force is adopting an expeditionary, capabilities-based mindset. Other lessons have looked at our expeditionary nature. The concept of a capabilities based air force is associated with being able to produce effects. The idea of producing effects is not new to Air Force thinking. A short lesson explains how effects-based operations can be used by all of the instruments of national power across the spectrum of conflict. Our capabilities-based mindset is being developed in a series of white papers called Concepts of Operations or CONOPS. These CONOPS expand upon our distinctive capabilities to describe specific mission scenarios the Air Force can perform. One such mission is that of "kicking down the door" in areas where an adversary is trying to deny us access. The Global Strike CONOPS was developed as a counter to anti-access strategies being developed as a method of asymmetric warfare. These two lessons do not begin to cover all of the thinking on evolving concepts going on in the Air Force. Some of that thinking may be adopted as doctrine while much of it will not endure. We present these two short lessons to pique your interest and urge you to explore further on your own.

Effects Based Operations Lesson

Introduction

The concept of effects-based operations is not new. Sun Tzu advocated such an approach as the highest form of warfare almost 2,500 years ago. The skilled general achieves his objectives using effects that make battle unnecessary. The Air Corps Tactical School applied an effects-based approach to strategic bombing as early as the 1930s. Their thinking spawned concepts and doctrine that had a major impact on airpower throughout World War II. An example is the preparation for the Normandy invasion. A major objective was the isolation of the battlefield. The disruption of the German rail system was an effect that would support this objective. Bombing of the marshalling yards was an action that would produce this effect. It's important to note that other effects were also pursued to achieve the objective. The deception operations Fortitude and Zeppelin both had the effect of diverting German forces from Normandy. It's also important to note that the disruption of the German rail system had rippling effects that led to the collapse of the German war economy. The challenge of identifying effects that lead to desired objectives and then identifying actions that produce those effects, without also producing undesired effects, is daunting. For this reason, the effects-based approach has only been applied sporadically throughout history and with inconsistent success. In this lesson, we'll help you understand effects-based operations and discuss how they might be better used in the future.

Objective

The objective of this lesson is for you to comprehend the concept of effects-based operations and why this concept is important in how the Air Force plans to respond to a wide variety of circumstances and situations in the foreseeable future. After completing this lesson, you should be able to explain the different categories of potential effects. You'll be able to describe the difference between objective-based and effects-based operations. Finally, you'll be able to explain EBO methodology and how it can be implemented in joint operations planning.

Overview

This lesson starts with a brief explanation of the EBO concept. The categories of effects are explained, followed by a discussion of the differences between effects-based and objective-based operations. The lesson concludes with a discussion of EBO planning methodology and how it can be implemented across the spectrum of conflict in joint operations.

EBO Defined

EBO is not employed as much as expected, because the concept is not well understood. To understand EBO you must first understand effects. Effects refer to the full range of outcomes, events, or consequences of actions, which can be derived from any instrument of national power whether economic, military, diplomatic, or information. Effects can occur at any point across the spectrum of conflict from peace to major theater war and at all levels from the strategic down to the tactical. Effects-based operations involve actions designed to achieve specific effects that contribute directly to the attainment of desired objectives.

Effects Classification

The term "effects" is inherently complex and difficult to understand—even with a definition. Therefore, it is helpful to classify, or break effects down into categories that may be more easily understood. Basically, effects can be categorized as direct and indirect effects. A direct effect is the result of actions with no intervening effect or mechanism between the act and objective. Consider the role of Suppression of Enemy Air Defense or SEAD attacks in achieving a reduction of enemy anti-air capability. The physical destruction of Surface to Air Missiles or SAMs and radars is a direct effect supporting the objective. Direct effects can trigger additional outcomes referred to as indirect effects that can also affect the objective. Operators at functional SAM sites may refuse to engage aircraft for fear of being attacked. This effect also supports the objective. The intimidation of the SAM operators is known as a second-order effect. Direct effects are usually easy to recognize while indirect effects often are not. Suppose the word got out to artillery crews that the SAM crews were refusing to use their weapons. The artillery crews might hesitate to fire their weapons and expose themselves to counter-battery fire. This would be a third-order effect of the SEAD attacks that supports an objective of the ground component commander. Various types of effects have been defined. Some are direct, some are indirect, and some can be either. Roll your cursor over the terms for a brief description.

Effects-based vs Objective-based

EBO is a refinement of the objective-based operations approach that is in current use. The objective-based method ties objectives directly to actions. Planning for objectives-based operations begins with national military objectives and proceeds to the determination of campaign objectives by the joint force commander. The functional component commanders define operational objectives to support the campaign and develop actions to achieve those objectives. The planning is a top-down process but during execution it becomes a bottom-up review to see how well the chosen actions and lower level objectives are contributing to higher-level objectives. Contrast this with effects-based planning. Effects-based operations tie actions to an effect that supports attainment of the objective. This may seem subtle to some or even pedantic semantics to others but the impact on planning is significant. The emphasis shifts from the actions to the effects for it is effects that achieve objectives. Identifying desired effects and preventing negative effects is now paramount for objective accomplishment. The study, or at least consideration, of effect interaction—the second- and third-order effects—is crucial. History has shown that the higher order effects related to our actions can be

significant. If those higher order effects are negative, mission failure can result. On the other hand, positive higher order effects let us double and triple the benefits from our actions leading to greater efficiency in mission accomplishment.

Why EBO?

Greater efficiency in mission accomplishment is the hope and promise of effects-based operations. Let's look at the operational level. In the traditional objectives-based methodology, the joint force commander's objectives are addressed by the functional component commanders—each trying to nail the JFC's objectives with their particular hammer. If instead, the JFC defines a set of effects to achieve, the functional commanders can draft their thinking in terms of what they can contribute to producing those effects. The focus is not on the tool, but what the tool can build. With this approach, integration of effort becomes more natural, allowing several components to contribute to a given effect. It also reduces the likelihood of generating counter-productive effects since every proposed action will be analyzed with regard to all of the effects it might produce.

National Strategic EBO

Effects based planning should begin at the national strategic level. The first phase, called Strategic Environment Research, corresponds roughly to intelligence preparation of the battlespace processes in existing joint doctrine, but goes much further. In order to understand what "effects" a given action is likely to create under given circumstances, we must understand the target audience, the systems involved, and all of the possible causal linkages between those systems. Answering these questions requires the collaboration of experts from many government and non-governmental agencies. With this information, national objectives are formulated, based on desired outcomes, and defined in terms of desired effects. Next, a national strategy is developed to decide which instruments of national power will be applied to achieve the objectives. A tighter integration of the instruments of national power can make pre-hostilities actions, like flexible deterrent options, more successful and is paramount for managing the post-hostility end state. With the strategy established, the national leadership distributes, or parses, the missions appropriately. The cycle ends, or actually begins anew, with effects assessment.

Combatant Commander EBO

With national level mission parsing completed, the Chairman of the Joint Chiefs tasks the combatant commanders to develop plans. The joint planning cycle of the Combatant Commander borrows heavily from the Commander's Estimate Process, outlined in both Joint Pub 3-0 and JP 5-00.2. The Commander's Estimate is deliberately focused on objectives, and has been used with success for years but should be enhanced to deliberately reference effects during the process. The process begins with the Commander's Assessment—essentially filling in the mission-specific gaps remaining from strategic environment research, like force structures, capabilities, and dispositions for all groups important to mission execution. Courses of action or COAs are developed and analyzed in terms of desired effects. Based on the foregoing, the military strategy is developed for the COA. In the next steps the commander issues the Operations Order

and Execution Order to employ EBO against an adversary's centers of gravity. Centers of Gravity, or COGs, refer to those characteristics, capabilities, or sources of power from which a adversary derives its freedom of action, physical strength, or will to fight. Once the plan is executed, post-operations intelligence of various types is gathered to assess the progress toward achieving the desired effects. Similar cycles support planning by the component commanders. Thus EBO planning can integrate efforts from <u>the</u> strategic to the tactical level.

EBO Example—ALLIED FORCE

Operation Allied Force offers an example of effects-based operations. The overall policy goal was to get Milosevic to accede to NATO's conditions. Various diplomatic, political and economic efforts were at work to achieve this objective. All of them probably contributed to Milosevic ending the war. From a military perspective, the primary means of creating effects to achieve the objective was through air attacks.

What effects could air attacks provide? It was known that Milosevic relied upon a set of key supporters or cronies as part of his power base. It was theorized that these cronies could have significant influence on Milosevic, if the cronies' political and business interests were attacked. The desired effect was to cause the cronies to suffer and influence Milosevic. To achieve that effect, other supporting effects, like the freedom to attack, were required. By focusing on the cronies, the desirable effect of minimizing adverse collateral damage was supported. As you can see, the interactions of actions and effects gets extremely complicated and this example is just for the air attacks. Sanctions surely had an effect on the cronies also. A complete diagram would be daunting.

In addition to the complexity of EBO, there is a lack of research on the assessment of higher-level effects. At the time, the United States had very little means of assessing its effectiveness until Milosevic conceded. Exactly why he conceded is still not known although it is believed that the cronies had a direct influence on Milosevic's decision.

Summary

EBO is not a revolutionary approach to war; however, it does have potential advantages over the traditional approaches of destruction and attrition that have been prevalent in warfare. If the US military can exploit this potential, they can move beyond the idea that the only way to win a conflict is to destroy the enemy's forces. Destruction-based operations will then become but one tool for joint force commanders to employ to accomplish their mission. Many critics view the EBO concept as one pushed by airpower and precision engagement advocates to increase the prestige and importance of certain services, branches, or weapons systems. In fact, the most successful effects-based operations involve all instruments of national power. Moreover, reliance on a single attribute of military power will inevitably detract from the overall effectiveness of a campaign, since it is relatively easy for an adversary to adapt to a single form of attack. However, realizing the full potential of EBO represents a significant challenge. EBO necessitates that decision makers move away from metrics that have been familiar and comfortable in the past, such as body counts, sortie rates, and territory seized. Such measures are easy to see and easy to measure, but they do not describe the linkage between actions and strategic outcomes. Clearly, it is important to explore concepts,

such as effects-based operations, that attempt to provide true indications of progress made toward achieving objectives.

ANTI-ACCESS

Introduction
The devastating air campaign and follow-up ground assault of the 1991 Desert Storm campaign against Iraq clearly demonstrated to both friend and foe the folly of opposing US strength on the battlefield. Desert Storm provided those with aims and interests contrary to America's a very important lesson learned. That lesson is that no nation on earth can win a toe-to-toe or symmetrical conflict with the United States if they give us sufficient time and access to prepare in the intended area of operations.
 If someone wants to oppose the U.S., they'll have to use their selected strengths against our perceived weaknesses. This is known as asymmetric warfare.   One strategy for asymmetric warfare against the US is called anti-access. The goal of anti-access is to deny the US the time and access needed to prepare for operations. To negate this strategy, we must develop counter anti-access strategies.

Lesson Objective
The objective of this lesson is for you to comprehend anti-access strategies as they relate to air and space operations. At the end of the lesson you should be able to describe asymmetric warfare and the impact anti-access strategies have on joint warfighting.   Finally you should be able to describe measures the Air Force can take to counter anti-access strategies.

Overview
The lesson starts with the broad concept of asymmetric warfare and then discusses anti-access strategies and specific actions to defeat anti-access strategies. Specifically, asymmetric warfare will be defined along with its key characteristics and categories. Next, the lesson will look at why you as a member of the U.S. Air Force should care about anti-access strategies. Finally, a short discussion on how the Air Force plans to counter these strategies will be presented.

Asymmetric Warfare – Definition
The concept of asymmetric warfare has been around for centuries. The great military strategist Sun Tzu wrote about avoiding an enemy's strength and attacking where he is unprepared. While Sun Tzu's statement captures part of the asymmetric warfare concept, Lt Col McKenzie's definition is more complete. It addresses the core concept of applying one's strength against an adversary's weakness but also addresses several key elements of successful asymmetric attacks.   These elements include achieving disproportionate effects; identifying the enemy's national will as the target; and the attainment of strategic objectives as the goal. The term asymmetric warfare officially entered the Department of Defense vocabulary when it appeared in the 1997 Quadrennial Defense Review.

Alternative Operational Concepts
There are various categories of asymmetric attack including the use of weapons of mass destruction, terrorism, and information attack. A category of asymmetric attack

that this lesson will focus on is called alternative operational concepts. The United States uses its superior technology to dominate the battlespace. Since most nations cannot compete directly against American technology, they look for alternative ways to operate that circumvent or negate the US's superiority in military technology.

Anti-Access strategy
An anti-access strategy is an alternative operational concept that an enemy could use to achieve their strategic objectives. Anti-access operations can deter, slow, or prevent U.S. forces from entering an area of responsibility or AOR. The actual weapons for anti-access, which can range from low-tech sea mines to high-tech surface-to-surface missiles, are not as important as how they are employed and "advertised."   Any weapon that offers the likelihood of high casualties, when used in a climate of low to moderate U.S. interest, can have powerful results. Anti-access strategies will be less effective or even counter-productive when a vital U.S. national interest is at stake. The overall goal of an anti-access strategy is to prevent the United States from being able to operate within range of the enemy's crucial targets or to make those operations so difficult or painful as to force America to abandon its attempts or prevent us from engaging at all. The bottom line is to create a Mogadishu event that causes America to abandon operations rather than a Pearl Harbor or 9/11 that serves to wake the sleeping giant.

Power Projection – Military strategy
US military operations have traditionally relied on the ability to deploy superior power close to an adversary. This concept is captured in many strategic planning documents which describe the United States' need to project combat power abroad to defend its interests. The goal is not to fight in New York harbor but to fight someplace else. To fight someplace else, the U.S. deploys its military forces forward to project national power.   This strategy requires time and access. The US needs access to theater bases, ports, airfields and littoral waters and sufficient time to build-up forces to counter the threat. The war is then fought, the enemy is defeated and the bulk of U.S. forces come home and reconstitute. The DESERT SHIELD/DESERT STORM operations were an excellent example of this strategy in action.

Anti-Access- A Strategic threat
A Defense Science Board study indicates that potential US adversaries have learned a few lessons from DESERT STORM and US military operations since then. They recognize the U.S. reliance on warning time and access to deployment bases and are actively preparing to exploit this reliance as a weakness. Consider a scenario where a surprise attack eliminates the warning time and anti-access measures limit the forces that can be moved into theater. The resulting situation could look a lot more like Normandy during World War II than the case we had at the beginning of DESERT STORM.

Anti-access – Weapons Threat
The growing military technical capabilities of potential adversaries present a significant obstacle to the U.S. military's access to sea ports and airfields needed for deployment.

The enemy threat consists of three categories: advanced conventional weapons; weapons of mass destruction; and commercial space-based command, control, communications, computers, intelligence, surveillance, and reconnaissance also known as C4ISR. The fact is, an enemy can buy very good resolution photo intelligence off the Internet today. Weapons of mass destruction are proliferating at an uncomfortably fast pace. Advanced conventional weapons, both offensive and defensive, threaten the air and maritime operations critical to US power projection.

Anti- Access: Political threat
In addition to the threat posed by enemy weaponry, there are political actions and infrastructure limitations that can delay or deny U.S. access to an area. Overflight restrictions can force U.S. Air Forces to take longer routes to a theater of operations. This slows the deployment schedule and increases the air refueling requirements for both airlift and strike sorties. Political actions can also create base access problems if a host country denies or limits U.S. military access to base facilities. Finally, even when given access by a host nation, the base infrastructure may be so limited that deployment is slowed until facilities are upgraded.

Countering Anti-Access Strategies
Since anti-access strategies are a form of asymmetric attack, the most important element of a counter strategy is to prevent a disproportionate effect. The best way to do this is to employ effective public affairs operations. Gaining broad public support for an operation and promptly responding to tactical setbacks can prevent the enemy from capitalizing on any failures of the force protection program. Force protection measures dovetail with efforts to minimize our vulnerabilities. Dispersed operations and passive defenses greatly complicate the targeting problem for the enemy. Being well trained to continue operations in environments where weapons of mass destruction have been used, nullifies most of the benefits an enemy could expect to gain from their usage. The final element of a counter anti-access strategy recognizes the primacy of the offensive by accentuating our strengths. The Air Force vision of expeditionary global vigilance, reach, and power has taken form in the Global Strike Concept of Operations. The Global Strike CONOPS is designed to take advantage of Air Force strengths to provide the means to "kick-down-the-door" in an anti-access environment and rapidly roll back adversary threats.

Global Strike CONOPS
Prior to conflict, the Global Strike CONOPS employs persistent, all-weather Intelligence, Surveillance and Reconnaissance elements to monitor adversary actions; identify, locate and track targets and threats; and develop and update plans for countering adversary anti-access strategies and capabilities. In the initial hours of a developing conflict, the Global Strike CONOPS employs a relatively small number of low-observable and standoff systems such as B-2s and F-22s, to "kick down the door" into denied battlespaces. Supported by a focused electronic and information attack, these systems rapidly degrade, and then defeat selected enemy anti-access capabilities and associated systems. This allows joint force commanders to employ follow-on forces to defeat the enemy and thwart his objectives. The Global Strike CONOPS capitalizes on

the Air Force's unique capabilities to precisely employ massive firepower at global ranges.

Summary
This lesson began with a broad look at asymmetric warfare. Asymmetric warfare attempts to leverage a tactical event for disproportionate effect to undermine American will, thereby achieving the actor's strategic objectives. Anti-access is an example of asymmetric warfare. Opponents recognize as a vulnerability the time and access the US needs to employ its power projection strategies. With the increasing availability of commercial space-based C4ISR capabilities, advanced conventional weapons and weapons of mass destruction, many countries are preparing to deny the US the time and access needed to protect its interests abroad. To counter these strategies, the US is taking steps to prevent disproportionate effects, to minimize its vulnerabilities, and to accentuate its strengths. The Air Force presents the Global Strike CONOPS as its counter to anti-access strategies. By concentrating on the strengths of expeditionary global vigilance, reach, and power, the Air Force provides the means to "kick down the door" to allow follow-on joint forces the freedom to operate in pursuit of US objectives.